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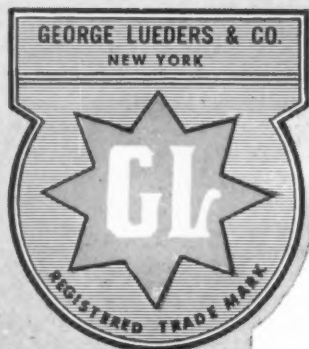
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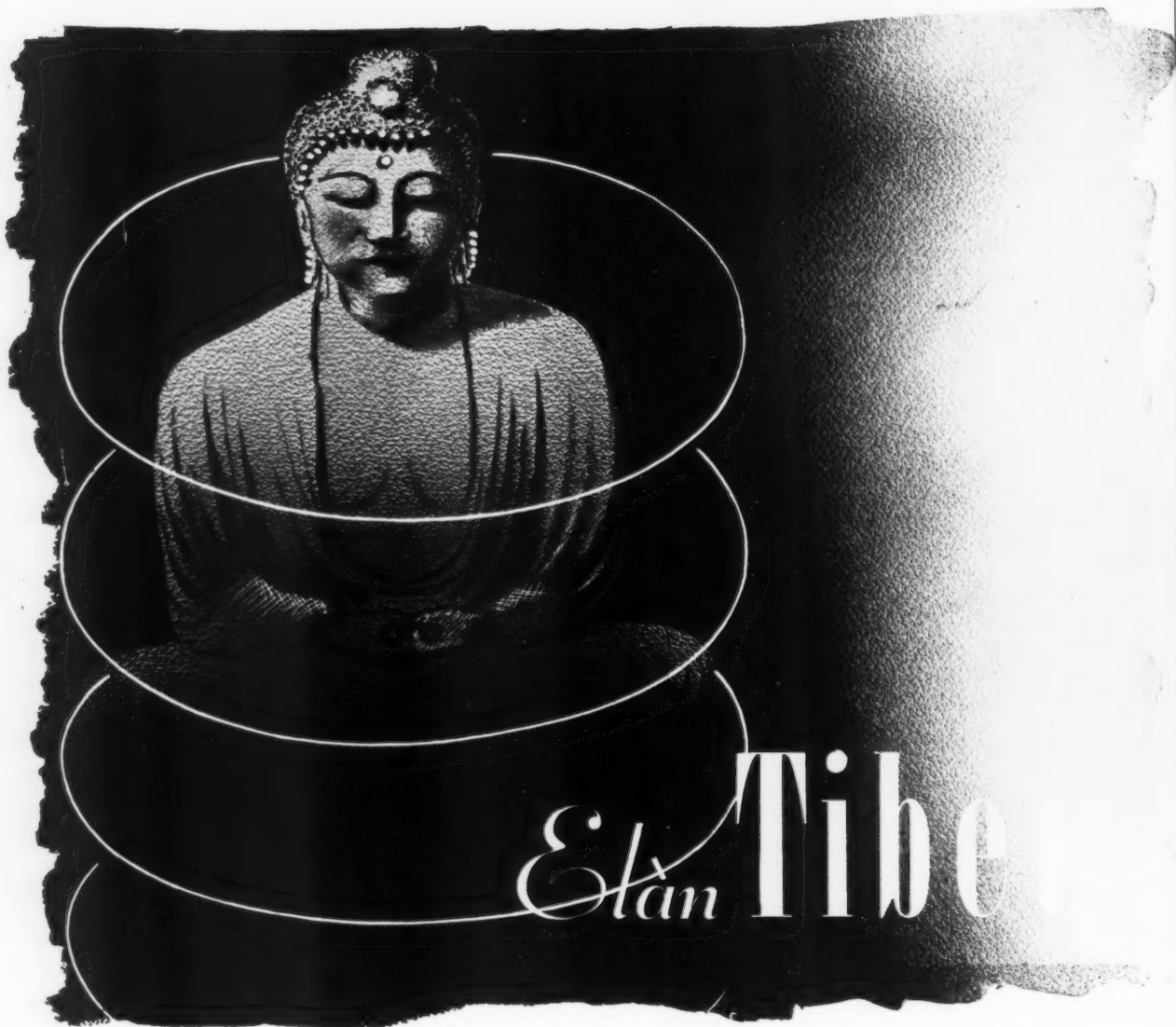
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338 April, 1947

The American Perfumer

MONTREAL, CANADA



SUFFERN, N. Y.

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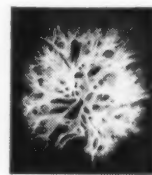
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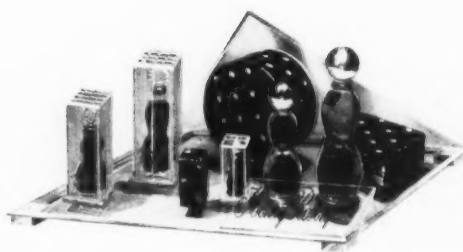
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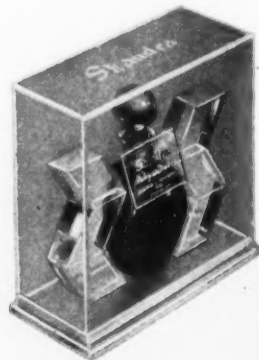
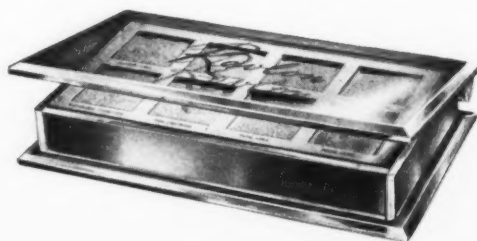
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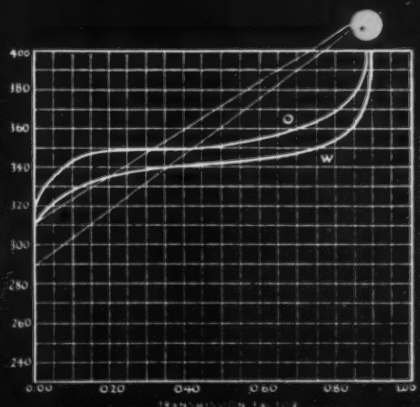
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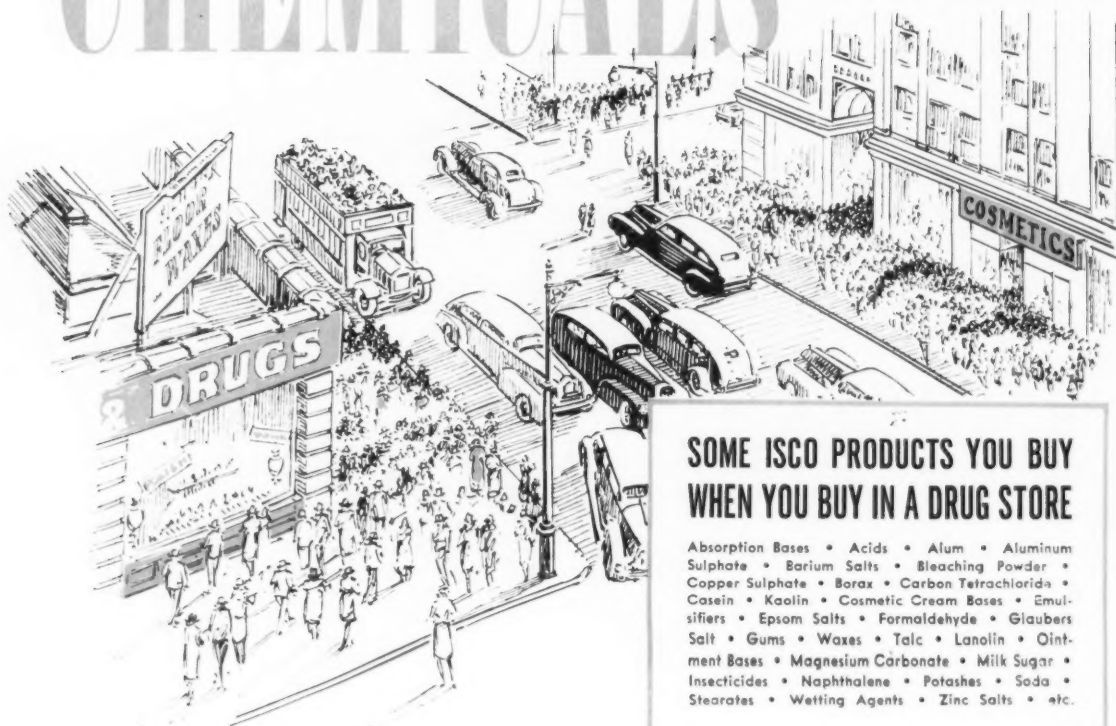
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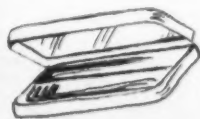
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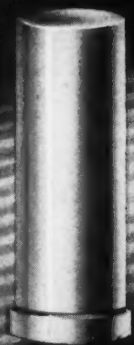
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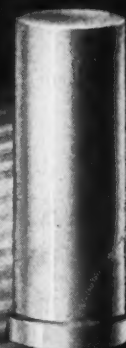
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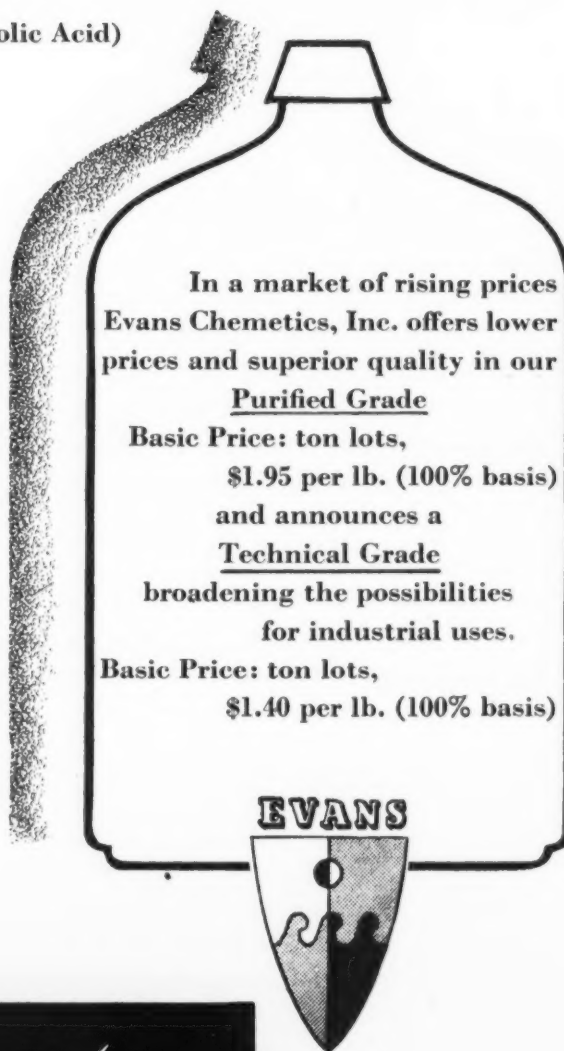
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Editorial Comment

Trade Practice Conference

The long awaited announcement of the Trade Practice Conference for the Cosmetic Industry has come from the Federal Trade Commission. It is scheduled to be held in New York, N. Y., May 12, and if need be, extending through May 13. This meeting was originally to have been held in January.

The timing is particularly auspicious as the annual convention of the Toilet Goods Association is to be held at the Waldorf-Astoria Hotel, May 14, 15 and 16.

The procedure involved in the Trade Practice Conference is to permit any person engaged in the industry to make suggestions on rules to govern the industry. Following a period for official consideration, these rules will be discussed in another open hearing. Subsequently, a set of rules will be published to aid those doing business in this field.

It is not compulsory that these regulations be followed as they have no official standing.

The Importance of Keeping Prices Down

The President of the United States in a recent press conference urged upon business and industry a policy of reducing prices. Certainly, there is no necessity of pointing out to the members of the toilet goods industry what can happen if living costs get out of hand. Most of them have lived up to their responsibility and have held the price line in the face of rising costs in materials, labor, advertising, etc.

The hardship which this has worked has spurred some firms into asking these questions: Can I change over from hand to machine operation anywhere in my production line? Is my inventory control adequate? Is my advertising and promotional material efficiently prepared? Can any sales territories be more advantageously covered? Can a package change be made that will cut costs, and at the same time improve appearance?

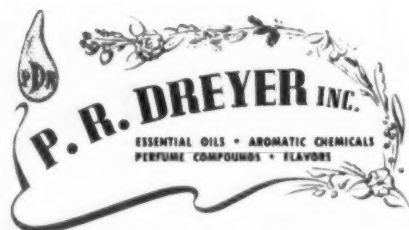
This is a good time to reexamine systems for wasteful practices.

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A lively baby market expanding by leaps and bounds is an open invitation to share in the baby boom. The Dreyer Perfume Stylist can help you select a group of delicate, wholesome scents suitable for infants or two-to-sixers, whether you are producing individual items or kiddy combinations of talcs, oils, soaps, ointments and creams.

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Desiderata

by MAISON G. DENAVARRE

PRESERVATIVE TROUBLE

Recently, an occasion showed how even experienced technicians can err in handling a well known preservative, methyl p-hydroxybenzoate. This compound is soluble to the extent of about 1:400 at room temperature, and considerably more at higher heats. During the time in question, the preservative had been weighed out, placed into the water, stirred a minute or so and left. Nothing else was added to the kettle. In due course the technician checked the dial temperature of the tank, was satisfied it was all right, and proceeded with the making of the batch.

At this point I walked up on the platform, happened to look into the tank with the water phase containing the preservative, and noticed that there was a lot of undissolved matter in the bottom of the tank. This was mentioned to the technician who was extremely surprised, since the water was already going into the fatty phase. I questioned the man further, and it seems that he had been doing it that way a long time, with no serious trouble. Maybe the preservative had been dissolved in previous batches, no one will ever know. But it certainly was not in this batch.

Further questioning showed that in the past a lot of *gritty* matter had been caught in the straining cloth tied around the water outlet. So it is a good bet that this fellow had been tossing out a lot of expensive preservative, let alone that the batches had been improperly preserved. The point is, sometimes we seem to forget that poorly soluble things take a lot of stirring or waiting or both, before they are com-

pletely dissolved. This also applies to antioxidants and to emulsifiers that contain soap as an auxiliary emulsifier. The soap sometimes is not sufficiently soluble in the balance of the fats and is left on the straining cloth rather than going into the batch. Its presence or absence makes a whale of a difference on consistency and stability.

WETTING AGENT SUPPLIERS

After too many years, this writer is again revising the well known "Wetting Agent Bulletin." It is intended to be International in scope. Scores of suppliers have been solicited to give the trade name, chemical composition, pH of 1 per cent solution, per cent active ingredient and if possible the Drave's wetting time.

But maybe we have missed a few. So, if we have, please forward the above information on all of *your* surface active agents, whether used in cosmetics or not. There is only about a month left to get your data in. Thanks for your cooperation.

SCIENTIFIC MEETINGS

The week of May 11th is to be quite a bonanza for technical men of the cosmetic industry. On May 13th, the Society of Cosmetic Chemists meets at the Biltmore Hotel for a day of Scientific Papers on cosmetics. On May 16th, the Scientific Section of the Toilet Goods Association will present a program of scientific papers, at the Waldorf-Astoria.

Cosmetic chemists from everywhere should support this scientific effort on the part of the only scientific society and the only trade association of the industry in this country.



M. G. DeNavarre at work in his laboratory

Make your reservations now. Both meetings are in New York City.

NEW MAKE-UP

The past couple of months have seen the introduction of at least two major and different make-up items. One a product similar to the well known cake make-up is a sort of compressed face powder with long lasting properties, but which requires no wetting to apply—a real boon. The other is a solidified greasy make-up, similar to other cake-grease make-up bases. But this one isn't as greasy as most others.

It just goes to show that the make-up field is far from exploited. There are still new fields to conquer. How about the emulsified lipstick? The emulsified cake make-up? I can think of others, can't you?

CREAM SHAMPOO INGREDIENT

A new formula is being circulated by a supplier of wetting agents that is supposed to give a "super" cream shampoo of the solid type. The ingredients have been reported here before, but this formula uses a different ratio. The finished product looks pretty good too. Nice and white; soft and creamy in texture; stable at 110 deg. F when so many turn translucent.

FILTER AID

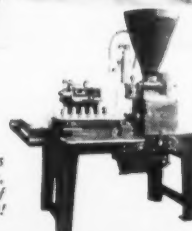
There is still too much magnesium carbonate being used as a filter-aid to my way of thinking. This is particularly true of the boys of the

USE THE *IDEAL CONTAINER* FOR SUNBURN CREAM!

COLLAPSIBLE TUBES are obviously the *ideal container* for sunburn cream. Compact, light in weight, sturdy, consumers find tubes easy to carry in handbag or beach kit. They can be used anywhere under the sun without danger of breakage or spilling . . . ideal for vacation and travelling. Manufacturers find that few containers can equal the convenient, economical and sanitary features of tubes. Their lightness and toughness make them ideal for shipping . . . no breakage problem. And when you specify tubes, be sure to "Specify *Sheffalloy*" (Sheffield Process) Collapsible Tubes. You will prefer their pliable extra strength; their fine, uniform quality; the craftsmanship that assures outstanding tube decoration. You can save time and trouble by ordering tube cartons simultaneously with the tubes, from this one dependable source. Write or wire our nearest office today for prices, samples, suggestions. No obligation, of course.



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older school of thought. To begin with, magnesium carbonate is slightly soluble in water. That being the case your de-ionized, softened or distilled water turns into hard water. The carbonate is particularly reactive with any compound that is faintly acidic. The resulting product of reaction may or may not be soluble in the solution . . . often it is insoluble, but not immediately so. As a result, the brightly filtered product shortly begins to turn cloudy.

Why not use the commercial filter aids that are free of this drawback. They don't cost any more, maybe even less.

Sometimes, it is unwise to filter immediately the product is made.

Usually it is best to let it stand at least over night, and preferably longer. Colloidal suspensions tend to coagulate and settle or be more readily filtered out. Chilling often helps as in the case of toilet water and shampoo.

IONIC vs. NON-IONIC EMULSIFIER

If your emulsion has been giving you trouble with viscosity, it may be due to the fact that your emulsifiers are *ionic*. Have you ever tried a non-ionic emulsifier instead? Hand lotion viscosity can be more readily controlled with non-ionic emulsifiers than with the soap type, particularly if no gum is used and if you are using polyol stearates. Try it.

A: The permanent wave oil difficulty can undoubtedly be laid to scarcity of required ingredients. Under separate cover we are sending you the names of several suppliers of this type of material. Meanwhile, you might try the following Permanent Wave Oil formula as a starter:

Light Mineral Oil 38 parts
Oleic Acid 8 to 10 parts
Triethanolamine . . . 3.8 to 4 parts

If this does not give you a satisfactory product and if you are unable to purchase what you want from the sources given, please let us hear from you.

645. TOILETRIES MANUFACTURERS

Q: *One of our South American clients is interested in obtaining formulas for the preparation of various cosmetic products, such as eau de cologne, skin cream, fine perfumes and toilet soaps. We should be interested in knowing whether you would be in a position to furnish us with the formulas required by our client.*

M. B.—TEXAS

A: Your client could probably use one or more texts on toilet goods manufacture. Volumes 1 and 2 of Poucher's *Perfumes, Cosmetics and Soaps* would be most valuable in the compounding and manufacture of colognes and perfumes. Volume 3 covers the practical manufacture of various toiletries, such as soap and skin creams. Another good book on cosmetic products is deNavarre's "The Chemistry and Manufacture of Cosmetics." An excellent book on soap manufacture is "Modern Soap Making" by Thomssen and Kemp. Generally speaking, it is better to buy the perfume compound for the manufacture of colognes and fine extracts rather than to attempt to make them. In the case of cologne, approximately 2 per cent is used with enough alcohol to keep a clear solution even at freezing temperatures. Fine perfumes require a minimum of 10 per cent and go as high as 20 per cent in their content of perfume compound. This of course is dissolved in alcohol and is aged as should be the cologne. Both should be chilled, filtered bright and bottled. We are unable to suggest anything in the way of skin creams because we do not know whether your client wants a cleansing cream, a powder base or a night cream.

QUESTIONS AND ANSWERS

642. CREAM OIL SHAMPOO

Q: *Sometime ago I wrote you about a formula for a cream oil shampoo, since then I have been experimenting with Orvus WA Paste. On heating and then mixing in glyceryl monostearate, we double the bulk of the shampoo. This increase is due to incorporated air. Would you have any suggestions whereby we could mix this item and not incorporate any air?*

J. B.—KENTUCKY

A: If you will melt the monoglyceride and melt the Orvus Paste, it is possible that at a temperature of about 70 deg. C. you will get a dispersion of the monoglyceride in the paste with a minimum incorporation of air. The materials will be quite fluid at this temperature. The important thing is to use the proper type of mixer because there is a tremendous tendency for aeration due to the high concentration of a powerful surface active agent.

643. SKIN LOTION DISCOLORATION

Q: *We have a skin lotion in which we use quince seed as the gum. It has a beautiful sheen but after aging it turns color, sometimes to cream color and later on to a light tan. We have tried making it without heat when soaking the seeds and again*

by using various degrees of heat. This does not seem to affect the results as they seem to turn out about the same. We want to keep the sheen and would like to know if you can tell us what is probably causing our trouble.

E. D.—OHIO

A: The discoloration may be due to the perfume in this way. The perfume may contain phenolic compounds susceptible to traces of iron, which may be found in the quince seed. The more heat used in the extraction water, the more color is bleached out of the quince seed skin. Ordinarily, cold water extraction is considered best and of course the mucilage must be preserved at all stages of the operation.

644. PERMANENT WAVE OIL

Q: *We are making a solution for permanent waving and are using what is commonly called Permanent Wave Oil, for the purpose of making the solution milky-white. At the present time we are supplied by a Canadian factory with this Permanent Wave Oil, but the solution is not satisfactory as the milky-white is concerned. Therefore, please be good enough to send us the names and addresses of manufacturers of this or similar products.*

H. S.—QUEBEC



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Aluminum Chlorhydrate, NEW

Antiperspirant Ingredient

THOMAS GOVETT*, MAISON G. deNAVARRET†

Aluminum chlorhydrate is a new

dermatological astringent now commercially available for use in deodorants and antiperspirants

THE increase in the use of anti-perspirants and deodorants has been one of the most important developments in the toilet goods industry during the past few years. Not only have women increased their use of these products, but men also are now a large and profitable market for them. At the present time the consumption of deodorants is increasing at the rate of about \$4,000,000 annually, and is expected to reach the rate of about \$30,000,000 by the end of 1947.

USE OF ANTIPERSPIRANTS OVER DEODORANTS

According to Dell Modern Magazines, 14th survey (1945), the best known antiperspirant cream showed an increase of from zero to 34.4 per cent of the deodorant market. The next nearest was the best known deodorant cream which showed a sale of 36 per cent in 1935 and had dropped to 28.8 in 1945. The best known liquid antiperspirant showed a sale of 24 per cent in 1935 and 6 per cent in 1945. This definitely proves that liquids, as such, are falling into disuse and that deodorants are slowly tapering off while antiperspirants are being increasingly used.

The *Farm Journal* in 1941 showed an average use of deodorants of 54.3 per cent in all classes of farm income.

In 1945, the Crowell-Collier Publishing Co. report showed that 61 per cent of the people were using antiperspirants and only 40 per cent were using deodorants. The antiperspirant and deodorant field was approximately

equally divided but there was a drop of 4 per cent from 1943 to 1945 in the leading deodorant sales and a drop of 1 per cent from 1943 to 1945 in leading antiperspirant sales.

The *Good Housekeeping* brand study of 1945 showed that 28.7 per cent of the sales in the so-called "deodorant field" were for a leading antiperspirant and 15.8 per cent for a leading deodorant.

The Fawcett Beauty Reader Forum for 1944 shows that there was an increase of 1 per cent in the number of people using preparations for underarm perspiration between 1942 and 1943. Creams constituted 86 per cent of the market, liquids 14.6 per cent and powders 4.1 per cent in 1943. This report again showed that the leading deodorant had lost ground, but so had the leading antiperspirant. It also brought out the fact that liquid antiperspirants were also losing ground.

The National Advertising Service reported in 1945 that 63.1 per cent of college men and 93.6 per cent of college women use a deodorant.

A six-year Fawcett survey shows that in 1946, 38 per cent used creams, 12 per cent used liquids, and 3 per cent used powders, compared to 1941 and 1942 when 81 per cent were using creams, 19 per cent liquids and 6 per cent powders. There was an increase of 4 per cent from 92 to 96 per cent in usage. Fifty-two per cent used deodorants and 49 per cent used antiperspirants.

There is considerable confusion between deodorants and antiperspirants in the mind of the consumer and people reporting in the above surveys. It can generally be said,

* Technical Director, Schofield-Donald Co., Inc.
† Director, Maison G. deNavarre, Associates.

nevertheless, that antiperspirants lead deodorants and that liquid antiperspirants are slowing losing ground.

NEW ASTRINGENT SALT DEVELOPED

The active ingredient in antiperspirants is almost invariably one of the aluminum salts, either aluminum sulfate or aluminum chloride, or both. Their use has always, however, been attended by the disadvantages inherent in any highly acid product.

Liquid antiperspirants invariably contain an aluminum salt unprotected with "buffers" or "anti-corrosive agents" while the creams are invariably thus protected. While buffering protected against rotting of clothing, at the same time, it decreased effectiveness.

Liquid antiperspirants, having greater effect, at the same time tended to irritate the skin more and also to rot clothing. There appeared to be no alternative; we either took both failings, or lost effectiveness.

Today, it is possible to have both effectiveness and safety to clothing and skin, by using a new commercial chemical known as aluminum chlorhydrate complex.¹ This compound has also been referred to as a basic aluminum chloride. It is the product of years of research and testing and has only recently been offered commercially.

ALUMINUM CHLORHYDRATE DIFFERENCE

Aluminum chlorhydrate is inherently different from, and less acid than, the normal salts. Consequently, there is less possibility either of skin irritation or of destruction to fabrics due to free acid. The following table shows the difference in pH values of different concentrations of basic aluminum chloride, aluminum sulfate and aluminum chloride.

Concentration of Salt	Aluminum Chlorhydrate Complex	Aluminum Sulphate N. F. $Al_2(SO_4)_3 \cdot 18 H_2O$	Aluminum Chloride N. F. $AlCl_3 \cdot 6 H_2O$
1 per cent	4.54	pH 3.06	pH 3.50
2.5 per cent	4.52	2.83	3.16
5 per cent	4.50	2.62	2.93
10 per cent	4.46	2.61	2.58
15 per cent	4.38	2.28	2.25
46 per cent	2.20
33.4 per cent	4.06	1.22

*Coleman pH Electrometer.

It will be noticed that the pH values of the aluminum sulfate and aluminum chloride are much lower than for aluminum chlorhydrate complex. The differences are even larger if, instead of comparing merely the strength of the solutions, we compare solutions with the same amount of aluminum or chlorine. A 15 per cent solution of aluminum chlorhydrate complex contains the same quantity of aluminum as a 46 per cent solution of aluminum sulfate, N.F. or a 33.4 per cent solution of aluminum chloride. The pH values of these solutions are also given in Table I above for comparative purposes. A 15 per cent aluminum chloride solution with a pH 2.25 contains approximately the same amount of chlorine as a 5.5 per cent solution of aluminum chlorhydrate complex with a pH of 4.50.

The exact nature of the physiological action of astringent deodorants is not clear. Some tests were, therefore, run on frog skins according to a standardized reproducible method to see what shrinkage might occur after exposure to alumi-

num chlorhydrate complex and aluminum sulfate solutions, and also to determine whether such exposure might decrease their permeability to water, as this should give an approximation of their comparative astringent values.

Table II shows the change in area of frog skins treated with the solutions.*

Test Sample	Concentration of Salt Per Cent	Area of Frog Skin Before Treatment sq. mm.	Area of Frog Skin After Treatment sq. mm.	Change Per Cent
Water	0.0	1575 1400	1576 1406
Aluminum Chlorhydrate	1.0	1058	941	-11.1
	2.5	1729	1574	-9.0
	5.0	1557	1149	-26.2
	10.0	1173	813	-30.7
	15.0	1226	829	-32.4
Aluminum Sulfate N. F.	1.0	1568	1388	-11.5
	2.5	1544	1392	-9.9
$Al_2(SO_4)_3 \cdot 18 H_2O$	5.0	1546	1294	-16.3
	10.0	1389	1242	-10.6
	15.0	1379	1215	-11.9

The results indicate that while aluminum chlorhydrate is as effective as aluminum sulfate in weaker solutions, so far as shrinkage of frog skin is concerned, it has an even higher astringent value in strong solutions.

Table III shows the effect of the two solutions on the permeability of frog skins to water.*

Test Sample	Concentration of Salt Per Cent	Osmotic Flow Through Frog Skins Before (B) ml/10 min.	After (A) interval	Ratio A/B
Aluminum Chlorhydrate	1.0	0.035	0.025	0.72
	2.5	0.037	0.029	0.79
	5.0	0.030	0.022	0.73
Aluminum Sulfate N. F.	1.0	0.037	0.041	1.11
	2.5	0.035	0.028	0.85
$Al_2(SO_4)_3 \cdot 18 H_2O$	5.0	0.028	0.028	1.00

These results confirm the results in Table II. So far as decreasing the permeability of frog skin to water is concerned, the aluminum chlorhydrate is more effective even in weak solutions.*

PROTEIN PRECIPITATION TESTS

About two years ago, a quick qualitative-semi-quantitative test for astringency had to be developed. One of us used a solution of preserved egg albumin, as being the more representative of undenatured protein, adding various aluminum salts to it.

In the test, egg albumin is diluted with equal parts of distilled water at room temperature. Five cc. of the solution is measured into a clean test tube. One cc. of the test solution is added.

Precipitation varies with the salt tested, as to quickness of formation, nature of precipitate and if it will remain insoluble over a 12-hour period. Admittedly, this test has its variables. Yet it does serve to determine relative values. Compounds known to be comparatively poor anti-perspirants show little if any precipitate. On the other hand,

*These tests were made by the Food Research Laboratories, Inc., Long Island City, New York.

formaldehyde, known to be a good anti-perspirant, produces only a faint cloudiness.

Precipitation is denoted as +, ++, +++, +++++, increasing with the number of plus signs. Table IV shows comparative values of some aluminum salts.

TABLE IV

	Precipitation	pH
Aluminum Nitrate	+++++	1.87
Aluminum Chloride	+++++	4.4
Aluminum Chlorhydrate Type E-1	+++++	2.9
Aluminum Citrate	+	2.4
Aluminum Lactate	+	3.4
Aluminum Sulfocarbolate	++	2.5
Formaldehyde
Methenamine

All the solutions were 10 per cent w/v of the normal commercial salts. It is obvious that basic aluminum chloride is equal to aluminum nitrate, chloride or sulfate, the best known astringents, and much superior to aluminum sulfocarbolate and the other aluminum salts.

The high pH does not appear to have lessened the astringent value of the aluminum chlorhydrate complex in any way, and these results have been confirmed by users of test creams, who report perfect satisfaction with the results obtained.

While it was hardly to be expected that the product would cause any skin irritation, in view of the decrease in acidity and the general experience that buffering aluminum salts decreases the possibility of skin irritation due to their use, a patch test was run on 25 human subjects. The results as anticipated were negative.

ANTISEPTIC TESTS

Inasmuch as body odor is due to the decomposition of perspiration, it was believed important to know if aluminum chlorhydrate had any inhibitory action on the standard test organism using the well-known Agar Cup Plate Method.

A zone of inhibition of 4 to 5 mm. was obtained in 24 hours using *S. aureus*, which remained unchanged after 48 hours had passed. A zone of this width is recognized as ample and more, for products remaining on the skin for 24 hours or longer. At this writing, bactericidal tests are being made and will be reported later.

An attempt to boost the bacteriostatic action of the aluminum chlorhydrate was made using several quaternary ammonium compounds. In the case of four compounds tested, there was either no increase in zone of inhibition or a small decrease could be noticed. Lauryl pyridinium chloride, however, seemed to boost the bacteriostatic action about 50 per cent. All quaternary compounds were used in a concentration of 1:500 based on the total volume of the solution.

EFFECT ON TENSILE STRENGTH OF CLOTH

The tests enumerated here were actually made on silk, viscose rayon, acetate rayon, wool and/or linen, and were conducted over a period of several years. Only three kinds of cloth are reported in Table V.

An important consideration in the selection of an astringent salt for use in antiperspirants is its effect on fabrics. Numerous factors can affect this test, hence all products formulated should be individually tested for

most accurate results. Thus, a water-in-oil emulsion of astringent salt will protect both fabric and skin against the action of the astringent salt.

Results using several astringent salts are enumerated below, showing per cent tensile strength loss on different fabrics by 25 per cent w/v water solutions.

TABLE V
Cotton
Per Cent

	Acetate Rayon	Wool
Aluminum Sulfate, N. F.	31	No test
Aluminum Chloride, N. F.	50	No test
Aluminum Chlorhydrate (Type E-1)	1.4	0
Aluminum Lactate	7.1	14.3
Aluminum Sulfocarbolate	20.3	3.2
Calamine Lotion, Official	1.8	15.9
Magma Aluminum Hydroxide, Official	0	0.5

Chemically, aluminum chlorhydrate is a basic aluminum chloride, having a ratio of aluminum to chlorine—2 Al to 1 Cl. It is, therefore, what is sometimes known as a 5/6 basic compound, meaning that of the 6 Cl atoms normally associated with 2 Al to form 2 AlCl₃, only one is present as Cl. It is not, however, a simple salt of the composition Al₂(OH)₅Cl, but a highly complex molecule. So far as is known at the present time there would seem to be between 6 and 9 Al atoms present in every molecule. That it dissociates to some extent is obvious from the pH of the aqueous solutions, a 15 per cent solution has a pH of approximately 4.4. In comparison with this an AlCl₃ solution containing the same amount of Al as a 15 per cent solution of aluminum chlorhydrate has a pH of 1.62; an HCl solution containing the same amount of chlorine would have a pH of 1.74.

Aluminum chlorhydrate is a white powder which dissolves freely in water to give a stable, aqueous solution. It has the following characteristics:

Al Content: as Al ₂ O ₃	Not less than 46 per cent
Cl Content:	Not less than 15 per cent
Sulfates:	Less than 0.05 per cent
Heavy Metals:	Less than 30 p.p.m.
Arsenic:	Less than 2 p.p.m.
Iron as Fe:	Less than 0.1 per cent

The standard product is a fine granulation, having an apparent density of 0.94, approximately that of water.

SOLUBILITY CHARACTERISTICS

Aluminum chlorhydrate is soluble in water in all proportions but the solution becomes extremely viscous in solutions of over 50 per cent, and are difficult to handle at this concentration. A 15 per cent aqueous solution has a specific gravity of 1.080 to 1.085.

81 gms. soluble in 100 gms. 25 per cent Ethyl Alcohol/Water
52 gms. soluble in 100 gms. 50 per cent Ethyl Alcohol/Water
3 gms. soluble in 100 gms. 75 per cent Ethyl Alcohol/Water
Insoluble in 100 per cent Ethyl Alcohol
100 gms. soluble in 100 gms. 5 per cent Propylene Glycol
Insoluble in 100 per cent Propylene Glycol
120 gms. soluble in 100 gms. 5 per cent Glycerine
Insoluble in 100 per cent Glycerine

Because of the differences between aluminum chlorhydrate and the normal aluminum salts, a satisfactory cream cannot always be prepared by substituting the equivalent amount of aluminum chlorhydrate for another aluminum salt in a cream formulation and, herewith, are some formulas. They are to be regarded only as basic formulas, to serve as a guide for further work according to the char-

acteristics desired by the individual manufacturer. Until some familiarity with the chlorhydrate creams has been attained, finished creams should be allowed to stand a few days to be sure they have reached a state of equilibrium.

The creams have been formulated with the use of acid emulsifying agents prepared by various firms. This does not mean that agents prepared by other firms have been tried and discarded; experimental work has been done only with the products of these firms:

FORMULA I

Stearic Acid	12 gm.
Light Mineral Oil, 65/75	2 gm.
Beeswax, White	2 gm. A
G-2152 ¹	5 gm.
G-2160 ¹	5 gm.
Titanium Dioxide	1 gm.
Water	58 gm. B
Aluminum Chlorhydrate Type E-1 ²	15 gm. C

Melt A and bring to 80 deg.; add B at 85 deg., and cool with agitation to 30 deg. Add C slowly with agitation.

FORMULA II

Tegacid ³	15 gm.
Glycerin	3 gm.
Spermaceti	5 gm. A
Water	59.9 gm.
Aluminum Chlorhydrate Type E-1 ²	15 gm. B

Heat A slowly over a water bath to about 95 deg. C. with constant agitation. Remove from water bath and continue agitation until temperature drops to about 40 deg. C. Add B and continue agitation until completely dissolved.

FORMULA III—CREAM

Tegacid Special ³	20.0 gms.
Span 60 ⁴	3.0 gms. A
Tween 61 ⁴	4.0 gms.
Ceresin Wax	2.0 gms.
Propylene Glycol N. F.	10.0 gms.
Arlax ⁵	2.0 gms. B
Aluminum Chlorhydrate (Type E-1) ²	15.0 gms.
Water	44.0 gms. C

Melt A at 85 deg. C., heat C to 85 deg. C. and add to A slowly, with constant stirring. The mixture is stirred until it cools to 70 deg. C. and B is added also at 70 deg. C. It is then stirred until cool.

FORMULA IV—COLOGNE

S. D. Alcohol #40	50.00 gms.
G-4 ⁶	0.25 gms.
Propylene Glycol N. F.	6.70 gms. A
Aluminum Chlorhydrate (Type E-1) ²	15.00 gms.
Water	26.45 gms. B

Stir A until clear. Dissolve chlorhydrate in water, then add B slowly to A with stirring. Allow to stand for 8 days, then filter.

FORMULA V

Kessco Wax A-33 ⁷	18 gm.
Light Mineral Oil 65/75	3 gm.
Propylene Glycol	3 gm. A
Titanium Dioxide	3 gm.
Water	20 gm.
Aluminum Chlorhydrate Type E-1 ²	15 gm. B
Water	38 gm.

A is heated to 95 deg. C. and allowed to cool to 35 deg. with constant agitation. The chlorhydrate solution is dis-

solved at room temperature and B is then stirred into A a little at a time until a smooth cream is obtained.

Obvious changes can be made regarding the use of hygroscopic agent, the quantity of titanium oxide to modify the whiteness and texture, the quantity of solids to modify the stiffness, etc. We would also emphasize the fact that, as is well known, the same formulations give different creams with the individual technics of those preparing them.

ANTIPERSPIRANT CREAM FORMULA

Base #93 ⁶	39 1/2 gms.
Stearic Acid	25 gms. A
Propylene Glycol	15 gms.
Veegum ⁷	75 gms.
Titanium Dioxide	2 gms. B
Water	75 cc.
Aluminum Chlorhydrate (Type E-1) ²	75 gms.
Perfume	q. s.

Melt A and bring to 70 deg. C. Make a dispersion of the Veegum in water, add the glycol and bring to 70-75 deg. C. Add B to A, agitating rapidly until the emulsion has cooled to 35 deg. C. Add the perfume, followed by the dry aluminum chlorhydrate which is added a little at a time and mixed in the cold until all of it has been dissolved. Let set overnight, re-mix and package. It is important to note the temperature at which the aluminum chlorhydrate is added. If added at a higher temperature, the emulsion may break.

"BUFFERS" NEED NOT BE USED

Generally speaking, aluminum chlorhydrate creams are softer than aluminum sulfate creams. They do not discolor, however, as do the aluminum chloride creams. Nor do they need a so-called "buffer" or "anti-corrosive" to prevent rotting of clothing and skin irritation. Another worthy consideration is that aluminum chlorhydrate creams do not tend to crystallize as readily as do aluminum sulfate creams in particular. Because of the higher pH, a wider choice of perfumes is available.

While aluminum chlorhydrate has the usual incompatibilities of acidic substances, it does not have all the faults of aluminum chloride or sulfate. Thus gums precipitated by aluminum sulfate, like polyvinyl alcohol, are not precipitated by aluminum chlorhydrate. The same applies to some of the cellulose derivatives.

Aluminum chlorhydrate is miscible with hydroalcoholic solutions, thus enabling the formulation of fast-drying antiperspirant-deodorant colognes.

It is the editorial policy of THE AMERICAN PERFUMER to use chemical names for all ingredients, and/or products, but some materials cannot be adequately described or identified except by the use of trade names adopted by the manufacturer. The quality and composition of the products designated by trade names are of course the responsibility of the manufacturer.

¹ Atlas Powder Co., Wilmington, Del.
² Schofield Donald Co., Inc., Newark, N. J.
³ Th. Goldschmidt Corp., New York, N. Y.
⁴ Givaudan Delawanna Inc., New York, N. Y.
⁵ Kessler Chemical Co., Philadelphia, Pa.
⁶ Continental Chemical Co., Detroit, Mich.
⁷ E. T. Vanderbilt Co., New York, N. Y.

HOW Polyols AFFECT Evaporation Rates

The results of tests on the evaporation of aqueous solutions and emulsions containing such polyols
O. C. CESSNA, E. O. OHLMANN, L. S. ROEHM* as propylene glycol, glycerine and sorbitol

THE cosmetic industry is a large user of various polyols which are incorporated in formulations for the preparation of lotions and creams of different types. Propylene glycol, glycerine and sorbitol are most commonly used. Although these compounds are of the same general type, polyhydric alcohols, there are differences in molecular structure. Propylene glycol has the same chain length as glycerine, but differs in the ratio of hydroxyl groups to carbon atoms. On the other hand, sorbitol has the same ratio of hydroxyl groups to carbon atoms as glycerine, but has a longer chain than the other two compounds.

In cosmetic preparations the polyols act as conditioners, utilizing one or more of their properties as humectants, plasticizers, emollients, solvents, or spreaders in order to give the final product the desired qualities. The work of DeNavarre¹ has shown that each of the polyols affect preparations in a different manner and, therefore, are not interchangeable.

The investigation, of which the data presented herewith are a part, was undertaken for the purpose of determining the effect of polyols on the fundamental properties of emulsions and to ascertain the difference in the action of the polyols under consideration. A further purpose is to endeavor to correlate the fundamental properties of emulsions with the qualities of the final product, thereby establishing a general relationship for selecting the most satisfactory type and quantity of polyol to impart the desired qualities.

EVAPORATION OF SOLUTIONS:

The first phase of the study has consisted of the determination of evaporation rates. Aqueous solutions containing 5, 10, 15, 25 and 35 per cent total polyol were prepared with each of the polyols and a complete range of polyol mixtures. Equal samples were then placed in uniform jars having an internal diameter of 2 3/16 in. and allowed to stand open in room air. Since a comparison was desired rather than an absolute value, a large group was run simultaneously and no attempt was made to control the temperature and humidity; however, readings were made to ascertain their value.

Each of the samples was weighed at six-day intervals and the total loss in weight calculated as per cent of the original. The total period of observation was 42 days. During the first series the relative humidity averaged 30-35

per cent, and during a second series of supplemental tests to fill out the range, it averaged 23 per cent.

The data from the two series are presented in Tables I and II. An examination of the data shows that, in every case, the evaporation proceeds until the residual weight was only slightly greater than the polyol content. In other words, the polyol solutions attain equilibrium with the water vapor content of the surrounding air. At the low humidity existing, the polyol content of equilibrium solutions is approximately 95 per cent so that the residual water content was small in comparison with the original total weight. Of course, the equilibrium water content would be greater under conditions of higher relative humidity.

TABLE I
Vaporization of Polyol Solutions
(Humidity—30-35 Per Cent)

Polyol	Conc. ¹ Polyol Per Cent	Weight Loss—Per Cent			
		6 days	18 days	30 days	36 days
None (Water)	0	19.6	76.5	100 ²	
Glycerine	5	27.0	67.5	93.0	93.2
	15	20.0	58.9	82.0	83.4
	35	21.4	44.4	57.8	61.4
50% Propylene Glycol	5	21.2	72.3	93.7	93.9
50% Glycerine	15	18.7	59.7	81.6	83.1
	35	20.2	51.6	61.1	62.7
75% Propylene Glycol	5	20.1	70.1	93.2	93.5
25% Glycerine	15	19.0	58.2	81.6	83.2
	35	19.6	50.4	60.2	62.4
85% Propylene Glycol	5	19.0	66.1	93.1	93.5
15% Glycerine	15	17.4	53.4	82.5	83.4
	35	18.4	44.7	62.0	63.2
50% Glycerine	5	25.0	74.7	93.8	94.2
50% Propylene Glycol	15	21.9	56.0	81.5	83.8
	35	20.0	41.6	57.5	60.7
10% Sorbitol	5	22.2	73.1	94.5	94.7
50% Propylene Glycol	15	19.9	60.4	82.1	83.7
40% Glycerine	35	19.9	52.4	61.5	63.2
10% Sorbitol	5	19.9	67.4	93.4	93.6
75% Propylene Glycol	15	17.5	55.0	83.1	83.7
15% Glycerine	35	16.1	48.2	62.9	63.7
10% Sorbitol	5	18.0	65.7	93.5	93.9
85% Propylene Glycol	15	18.9	55.9	82.6	83.5
5% Glycerine	35	22.2	54.5	72.9	73.9
15% Sorbitol	5	24.6	78.0	95.0	95.0
50% Propylene Glycol	15	22.9	65.4	84.0	84.7
35% Glycerine	35	20.6	55.1	63.4	64.5
25% Sorbitol	5	27.1	83.8	94.8	94.8
50% Propylene Glycol	15	24.9	74.1	84.8	85.1
25% Glycerine	35	24.1	57.8	64.0	65.0
Sorbitol	5	24.25	69.45	93.8	94.0
	15	27.0	63.6	83.5	84.6
	35	22.2	53.5	64.1	65.3

¹ Data on 10 per cent and 25 per cent available

² Twenty-three days

* The Dow Chemical Co.
This paper was presented before the Scientific Section of The Toilet Goods Association, Inc., December 5, 1947.

TABLE II
Vaporization of Polyol Solutions
(Humidity 20 Per Cent Av.)

Polyol	Conc. ¹ Polyol Per Cent	Weight Loss—Per Cent			
		6 days	18 days	30 days	36 days
Propylene Glycol 33 1/3%	5	31.7	85.9	97.0	95.0
Glycerine 66 2/3%	15	28.9	75.5	85.8	84.2
	35	30.3	58.4	65.0	63.8
Propylene Glycol 60%	5	34.0	91.0	96.2	95.0
Glycerine 40%	15	27.3	72.9	85.4	84.2
	35	24.1	55.7	65.4	64.8
Propylene Glycol 66 2/3%	5	32.2	81.9	96.2	94.8
Glycerine 33 1/3%	15	27.7	69.8	86.2	84.5
	35	28.7	57.5	65.5	63.5
Propylene Glycol 75%	5	30.7	83.9	95.2	95.5
Sorbitol 25%	15	27.6	69.5	83.6	84.0
	35	24.0	55.7	64.8	65.5
Propylene Glycol 66 2/3%	5	28.3	77.5	97.2	95.3
Sorbitol 33 1/3%	15	25.8	69.6	87.2	85.5
	35	28.0	59.3	67.2	66.0
Propylene Glycol 50%	5	34.3	83.2	95.2	95.2
Sorbitol 50%	15	30.0	68.9	84.8	85.4
	35	27.4	59.1	66.8	67.7
Propylene Glycol 33 1/3%	5	29.3	77.8	96.9	95.3
Sorbitol 66 2/3%	15	27.4	71.0	93.4	86.3
	35	31.0	63.8	69.2	67.6
Sorbitol 66 2/3%	5	27.9	78.6	96.8	94.9
Glycerine 33 1/3%	15	26.4	70.5	87.4	85.6
	35	31.9	63.8	68.4	66.9
Sorbitol 33 1/3%	5	29.6	79.3	96.7	94.8
Glycerine 66 2/3%	15	26.7	71.0	86.2	84.5
	35	28.8	61.5	67.7	66.0
Propylene Glycol 25%	5	28.3	78.2	94.8	94.8
Sorbitol 25%	15	24.7	64.0	83.8	84.2
Glycerine 50%	35	23.7	54.5	65.1	65.8
Propylene Glycol 25%	5	27.3	77.4	95.5	95.3
Sorbitol 50%	15	25.6	65.8	86.8	86.8
Glycerine 25%	35	24.4	55.5	65.9	66.6
Propylene Glycol 50%	5	34.9	83.2	95.0	95.5
Sorbitol 35%	15	30.6	68.3	85.0	85.3
Glycerine 15%	35	28.3	56.2	65.3	66.0
Propylene Glycol 60%	5	33.7	86.8	95.3	95.3
Sorbitol 20%	15	27.9	72.0	84.8	84.8
Glycerine 20%	35	25.6	57.0	64.3	64.8

¹ Data on 10 per cent and 25 per cent available

The rate of evaporation is illustrated by Figure 1, which shows the weight of loss-time relation for 15 per cent solutions of each polyol. The initial rate was comparable to that for water, the curve for which is also shown; but the rate of weight loss of the polyol solutions decreased as they approached the equilibrium concentration, while that for water continued at a nearly constant value until the water was completely evaporated. However, it will be noted that a large proportion of the water had evaporated from the solutions before the decrease in rate occurred. These curves and the data show that, in all cases, the solutions had nearly reached equilibrium in thirty days and ceased losing any appreciable weight; although, a few continued to lose small amounts.

In comparing solutions containing different concentrations of the same polyol or polyol mixture, it is interesting that the evaporation during the initial period is essentially independent of concentration and follows that of water. However, after eighteen days the evaporation rate of the more concentrated samples materially decreases, while the dilute samples continue to lose weight at the initial rate for a longer period. It appears that the change in rate occurs when the residual solution has attained a particular polyol concentration. Therefore, the primary effect of differences in the initial total polyol content is to establish the proportion of the solution that must evaporate before the evaporation rate decreases. Although solutions

EVAPORATION OF 15% POLYOL SOLUTIONS

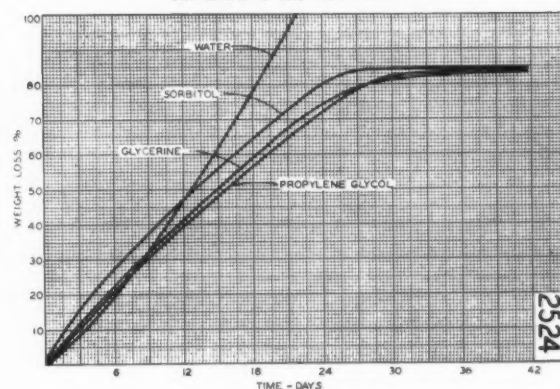


Figure 1

with smaller amounts of polyol continued to vaporize at a high rate for a longer period, the decrease was more rapid when it occurred. Therefore, the samples approached equilibrium at approximately the same time, regardless of the initial polyol content. The evaporation after that period is very slow and is greatly affected by humidity changes.

When solutions containing the same total quantity of polyol of varying composition are compared, the two sets of tests must be considered independently, or a correction applied. The difference in humidity, although small, produced a variation of sufficient magnitude to prevent direct

WEIGHT LOSS OF 35% POLYOL
SOLUTIONS AFTER 18 DAYS

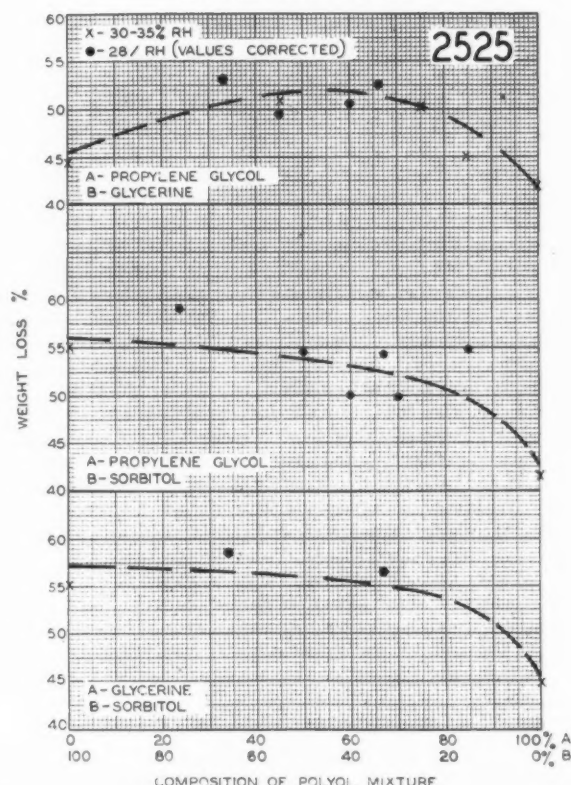


Figure 2

comparison. However, in each series it will be noted that differences in polyol composition do not produce change in evaporation rate of practical importance. In spite of this fact, a study of the data indicates some trends that are worthy of observation from the standpoint of a study of fundamental properties. In general, the evaporation rate of sorbitol solutions is greater than that of propylene glycol solutions, which, in turn, is slightly greater than that of glycerine solutions. Although a uniform transition might be expected in solutions containing two polyols in varying proportions, there are indications that the increase in ratio of glycerine to propylene glycol actually increases the evaporation rate, so that a maximum is observed at an intermediate composition. On the other hand, the increase in ratio of propylene glycol to sorbitol produces a slight change in evaporation rate until the concentration of propylene glycol greatly exceeds that of sorbitol, at which time the evaporation rate decreases rapidly. This trend is indicated by the curves on Figure 2. These curves are plots of the weight loss from 35 per cent polyol solutions during an 18-day period, versus the polyol composition. Since points from both series are included, the values for the set at lower humidity were corrected to be comparable to those for the other set. This correction was made on the basis of results from samples of the same composition that were run in both series.

When considering solutions of all three polyols, it is noted that an increase in sorbitol in solutions containing equal parts of glycerine and propylene glycol produces no change in evaporation rate. This is due to the high value of the glycerine-glycol mixture. On the other hand, the presence of propylene glycol decreases the rate of evaporation for sorbitol-glycerine solutions, while glycerine produces only a slight decrease in the rate of sorbitol-glycol solutions.

EVAPORATION OF EMULSIONS:

The evaporation of oil-in-water emulsions will generally follow the same relation as that of aqueous solutions, since the water is the extensive phase. The same is true of vanishing creams that are dispersions of stearic acid in water. This is illustrated by data of DeNavarre² presented in Table III. The vanishing cream of formula shown in the table was prepared with each of the polyols and allowed to stand in open uniform jars in room air. The data show an initial rapid rate of evaporation followed by a decrease in rate as the evaporation proceeds. At the end of five weeks the samples containing propylene glycol and sorbitol had both lost weight nearly equivalent to the initial water content. This compares with the observation previ-

ously made on the solutions. However, the data on the vanishing cream differ from those on solutions, in that the sample containing glycerine showed a greater decrease in evaporation rate after the third week, so that a larger proportion of water remained after the five-week period.

The situation with water-in-oil emulsions is quite different. During evaporation, the water vapor must diffuse through the film surrounding the droplets and will probably be evolved only from those near the surface. As a result, the evaporation rate is very low in comparison with that from solutions and oil-in-water emulsions.

In order to ascertain the effect of polyols on water-in-oil emulsions, a series of samples were prepared using mineral oil and petrolatum as the oil phase and polyol solution as the aqueous phase. The polyol content of the solutions varied from 0-15 per cent and samples were prepared with each of the polyols under consideration. The basic formula and the results of the evaporation tests are presented in Table IV. Those for emulsions containing 10 per cent polyol are also plotted in Figure 3.

TABLE IV

Evaporation of Water-in-Oil Emulsions Containing Polyols	
Polyol	Per Cent Polyol
	Days
	7
	14
	41
	59
	96
	123
None	0
Propylene Glycol	5
	10
	15
Glycerine	5
	10
	15
Sorbitol	5
	10
	15
Formulation	
Mineral Oil	30 per cent
Petrolatum	20 per cent
Arlacel C	1 per cent
Polyol (Water)	49 per cent

The low rate of evaporation is immediately apparent since the control lost only 3.5 per cent in 18 weeks. In comparing the effect of the three polyols, emulsions with the lower concentrations of propylene glycol showed an overall loss slightly less than that of the control, while that with 15 per cent propylene glycol had a much greater loss. The samples with all three concentrations of glycerine and sorbitol showed greater rates of evaporation and there was no trend with concentration. This rather unforeseen

TABLE III

Evaporation of Stearic Acid Cream*

Polyol	Weight Loss—Per Cent			
	2 weeks	3 weeks	4 weeks	5 weeks
Propylene Glycol	29.8	48.5	58.3	66.3
Glycerine	28.0	43.3	52.3	55.9
Sorbitol	34.0	56.6	60.0	66.2
Formula				
Sodium Hydroxide	0.25 per cent			
Stearic Acid	15.0 per cent			
Potassium Hydroxide	0.75 per cent			
Detyl	0.50 per cent			
Polyol	15.0 per cent			
Water	68.5 per cent			

* DeNavarre, unpublished data

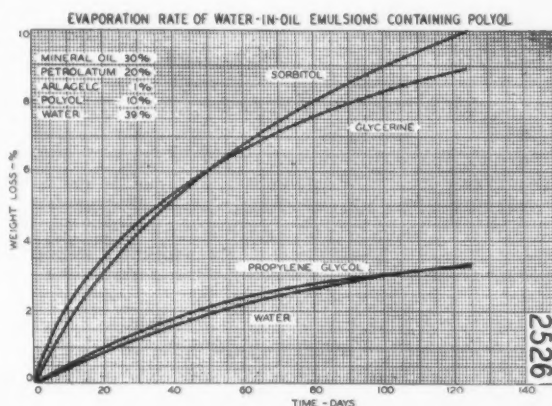


Figure 3

result is probably related to the fundamental effect of polyols on emulsions.

DISCUSSION:

The literature^{3, 4, 5} indicates that polyols decrease the surface tension of water and the interfacial tension between oils and water and in this way assist in the formation of certain types of emulsions. The effect is probably due to the tendency toward mutual solubility and the alignment of the polyol molecules at the interface. On the other hand, glycerine has been used as a de-emulsifying agent for some emulsions of the water-in-oil type. In addition, it has been reported that the lower alcohols have emulsifying properties for oil-in-water emulsions, but the higher alcohols are effective in forming emulsions of the water-in-oil type; while polyhydric alcohols, particularly glycerine, are not effective as emulsifiers alone but assist in forming oil-in-water emulsions.

In the work of DeNavarre,¹ in which it was concluded that the polyols are not interchangeable, it was observed that, in a water-in-oil type cream, the control and the sample containing propylene glycol had the greatest stability, while the sample containing glycerine showed the most oil separation. On the other hand, in an oil-in-water lotion, the control and the sample containing glycerine remained fluid, while the samples containing propylene glycol and sorbitol would not flow after storage. This was probably due to inversion of the phases.

On the basis of these various observations, it appears that glycerine promotes the formation of oil-in-water emulsions, while propylene glycol favors water-in-oil emulsions and their use in the wrong type promotes instability or inversion. Sorbitol is apparently between the two and may trend toward the performance of either, depending on the conditions and emulsifier. This tendency can also be postulated from their properties and the theory of emulsification. Since it has been indicated that molecular orientation of the emulsifier at the interface is a factor in emulsification, and the emulsifier bends the interface so that the liquid in which it is soluble becomes the extensive phase, it is logical to assume that polyols as emulsion aids would act in the same manner. The lower ratio of hydroxyl to carbon in propylene glycol would place a greater proportion of the molecule in the oil phase than would be the case with glycerine, and, therefore, would alter interfacial curvature. Although sorbitol has the same ratio of hydroxyl to carbon that glycerine does, the size of the molecule would favor the oil phase, while the number of hydroxyls would favor the water phase, thereby placing this material in an intermediate position.

Again referring to the evaporation rate of water-in-oil emulsion, the unusual performance of the glycerine and sorbitol samples cannot be explained specifically; however, these materials undoubtedly alter the droplet size and oil film and detract from the stability. These factors may, in turn, increase the evaporation rate due to the thinness or breakage of the oil film.

Most of the qualities of a preparation can be related to the fundamental properties of the emulsion, such as solubility, particle size, viscosity, cohesion, interfacial forces, viscosity of the individual phases, wetting of particles and density. It is evident that the polyols, although similar in type, have diverse effects on the fundamental properties.

Therefore, it is believed that further work leading to an understanding of these factors will be of assistance in selecting the quantity and type of polyol required to impart particular properties to a preparation.

SUMMARY:

The results of tests on the evaporation rate of aqueous polyol solutions and suspensions in water show that the evaporation proceeds at a decreasing rate until all but the equilibrium water content has vaporized within a period of thirty to forty days. The nature and quantity of polyol used had little effect on this relationship.

Emulsions of the water-in-oil type show a very much lower rate of vaporization. Moderate quantities of propylene glycol do not affect the evaporation rate; however, additions of glycerine and sorbitol materially increase the relative loss in weight.

The three polyols considered undoubtedly affect the fundamental emulsion properties in different manners, since glycerine and propylene glycol appear to have opposite effects in emulsions of the same type. The difference in evaporation rate of water-in-oil emulsions is traceable to these properties which also probably control other qualities of the emulsion when polyols are used as additives.

¹ DeNavarre, *Proc. Sci. Sec., Toilet Goods Assn.*, No. 4.

² DeNavarre, Unpublished data.

³ Berkman and Egloff; *Emulsions and Foams*; Reinhold.

⁴ Adam; *Physics and Chemistry of Surfaces*; Oxford.

⁵ Young and Coons; *Surface Active Agents*; Chemical.

⁶ Symposium: *Emulsion Technology*; Chemical.

Book Review

MOSQUITOES OF NEW JERSEY AND THEIR CONTROL, by Thomas J. Headlee. 326 pages, illustrated. Rutgers University Press. 1945, price \$4.00.

*The fame of the proverbial New Jersey mosquito is well known to all of us, including size, numbers and nuisance value.

This book deals with those aspects of mosquito control that are of passive interest to cosmetic manufacturers who might be interested in rendering their sun tan lotion or leg make-up insect repellent. Of the 326 pages, about two pages are devoted to repellents. Even though mosquito repellents have been cradled long at Rutgers University, one would expect a great deal more information on them than the crumbs given here.

There are literally hundreds of chemical compounds that were tested prior to the war, all subjects of letters patent. This was public information and not "top secret." No patents are mentioned by number. Nothing is mentioned of impregnating clothes with insect repellents.

From the repellent point of view the book is a failure. Admittedly, repellents are not the cure, but they are a means of control as far as the individual is concerned.

The author is in his element, however, when he delves into the description, life histories, breeding places, food, natural enemies and control of mosquitoes. The book appears to be complete in this respect. Since that is the author's real goal, he is to be congratulated.

When the revision of this book is published, "top secret" repellent data will no longer be secret; it can then be added. At the same time, it would be helpful if the author wrote an index to this valuable book.—M. G. deN.

THREE new cosmetic trends have developed during the past six weeks to a point where they are recognized by every buyer and merchandiser.

NO SUBSTITUTES ACCEPTED

1—Women want what they want when they want it. No substitutes are accepted. A specific item is asked for, and unless it is supplied, customers walk out of the store. Price is not included in this trend. Buyers who have been observing this, define it as not selective. "This is a development that has grown up since Christmas. There was little heed given to it, for only occasionally did the clerks call it to our attention," said buyers.

Stores that have been seeking some underlying reason for the slow movement in cosmetics have made this discovery. It may cover a multitude of sins of omission—just not the right stocks. Because of out-of-balance inventories many cosmetic departments must suffer shortages in their supplies.

In contrast to the reports from big city stores, suburban towns report "a nice Spring business."

SUBURBAN STORES REPORT GOOD SALES

These smaller stores are ones in which the owners often greet the customers, by name. These men are so close to the consumer that they know what she wants and are now making it their business to serve her better than before, realizing that her comments on the big city store's low stock is making hay for them.

CHOOSY SELECTIVE BUYING

2—Selective buying continues to be very choosy. This is not a new trend but it continues to grow more pronounced. Women complain that prices are too high. The elimination of lipsticks in plastic and the return of higher priced ones in metal cases is one instance. Many women discarded the plastic cases and did not bother with a re-fill. Now re-fills will be more popular and higher priced metals sold less often.

Women want more perfume. But they object to purchasing a large bottle when they want a variety of scents. Stores having dram counters are doing a good business solely on this account, and the clerks are selling colognes to match so that a lighter fragrance may be worn for all day wear. Women are frank to state they do not want the same fragrance for business and social occasions. Others want to have a change every day, merely for the stimulation it gives, and the sense of well-being.

In the matter of lip-rouge and nail colors much the same situation is seen. Again variety is wanted but the cost runs high if both units are matched, even with the attractive sale prices. Wasson's of Indianapolis has been featuring the five units for matching ensemble—lipstick, nail polish, face powder, cream rouge, dry rouge. Steven's of Chicago has featured a fine skin oil and the same type of soap and shampoo and these combination ads are aids to better and more sales.

One buyer of an important suburban store, adjacent to a great city, made this comment regarding selective selling: "Our women are all in the well-to-do middle class and they want a variety of shades of lipstick. The other day when I checked on inventory, I found we were carrying almost 100 shades from five leading makers. Many of

Three new trends mark buying . . . The demand for sales training continues . . . Treatment lines

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TRENDS

IN THE

MID-WEST

these were duplicates. In order to better serve our trade we plan to choose the best shades from each line and reduce our inventory. A purple-red in one line may be more flattering than in another; a blue-red may also have this shade in several lines and we will select the one for which our customers have shown a preference. The same goes for the pure red, the yellow-red and the red with plenty of brown. The only time we really get stuck with colors are those which are too exotic. City stores sell these to tourists, but we don't have that trade," she said.

NEW PRODUCTS WANTED

3—"If it's new it sells," is the comment throughout all leading cosmetic shops and stores. The only catch is that there must be plenty of display, in the store and the window, and if national advertising has appeared in a high style magazine, the picture of the product, placed beside the merchandise, carries much selling power.

The question women ask is "What's new? How much?" and then state the item in which they are interested. This new product demand has made every sales girl very much aware of what is being nationally featured. If the merchandise is not available, women say nothing, but leave without any purchase.

CURRENT ROUGE TRENDS

Three different types of rouge have a better sale throughout this area than they have had in some time. These

have always been apparent but never have these trends stood out as at the present time.

1—The older woman of mature years is asking for and using a dry rouge. Some of the suggested Spring-Summer make-up kits include this rouge although it has usually been considered to be a type only for a quick re-make-up job. On the older woman this type of rouge tends to accent the dryness of her own skin. Unfortunately, she will not take the word of the girl behind the counter, yet she will purchase \$25 worth of treatment creams to try and remedy this very dryness!

When any of the tinted basic creams are suggested she will refuse these because it would mean using cream rouge and this she feels takes too much time to apply. Nowadays anyone selling cosmetics can judge a woman's age rather accurately—but is gracious enough not to do so.

NATURAL LOOK BECOMES A FAVORITE

2—The college girl and her business sister have found the natural complexion so flattering that it has been adopted and has resulted in high compliments from the "boy friend" who thinks the girl looks real. This is the woman who carefully selects the tone of cream rouge to match her own skin, plus a tinted base to give an over-all moistness to the skin that is highly flattering, for it is much like that of a year-old baby. Usually this woman takes the advice of the person who is serving her. Instead of one sale of rouge being made there is the lipstick, the jar of cream rouge and the basic cream as well as the right powder tint, completed with a matching nail polish. Every clerk likes to serve this trade.

3—The only sophisticate in the matter of rouge selection is Miss High-School who would use a black lipstick if she could find just the right shade of black. She wants them all very dark, luscious and most "inviting" she tells the clerk. The girl usually comes in with her friends who take an important hand in what she finally purchases.

The only thing which these clerks have gotten across to the high school students is the importance of a clean face. Too much cake powder has left many with roughened skin and only by the use of a good soap and brush can this be remedied. Soap and complexion brushes have moved into more important selling positions.

SALES TRAINING DEMAND GROWS

Some two years ago when Walgreen's began a sales training program in cosmetics for its entire staff, there were wisecracks who thought it was a possible waste of time. Today, this store, and similar chains that have taken the time and energy to train their people for specialized selling are doing such a wonderful job that department stores complain their best sales people are leaving to join the ranks of competitors.

The first important department store step is being made by some of the suburban stores which are having their small staffs given special training by the manufacturer's own representative. Not only do they go to school at specified times but so great has been the demand from buyers for instruction that a number of Chicago branches will hold evening sessions.

FRAGRANCE TESTING AIDS SALES

During the days when perfumes and colognes were slow in delivery or short in supply there were only a few test-

ing bottles to give one an idea of the fragrance. Usually these were kept just outside the customer's reach. Today they are on the counter and women enjoy this "sampling" of fragrances. In about one half of the instances of this sampling a sale is made, if not in the fragrance tested then in another.

COLOGNES SELL IN LARGE STORES

Colognes are used in all of the larger stores rather than perfume, which is scented only when there is a dram shop and the glass stop-stick has a drop of fragrance on it.

Atomizers are again in good supply but are moving so fast that many stores are cleared out in a week of a supply that would normally have lasted a month. Glass bottles, American made, and the first imports are again being featured very extensively. With so many of the new perfumes and colognes being packaged in collector's style bottles, and boxes, there may be a slight decline in the so-called vanity table type of bottle which is now enjoying such a good sale.

TREATMENT LINES VERY ACTIVE

Despite all the talk of slow movement of merchandise in stores that have nationally advertised and well known lines, all treatment lines are enjoying a return to excellent sales. Dry skins are being given unusual attention and not only is a cleansing cream featured as a must but often there are clever hints on how it is to be used. Marshall Field & Co., Chicago, is offering one beauty tip each time the store runs an ad. such as this simple but effective hint: "Smile when applying your lipstick . . . so that all skin crevices will be covered evenly."

To give a Spring rejuvenation, treatment creams have been widely featured by stores in Kansas City and St. Louis. Spring comes early to these cities and the presentations stress this. In contrast, the Northwest cities, still snow-bound, are suggesting that there are wonderful lotions for smooth hands and to eliminate house-cleaning stains and strains.

Some of the stores are offering the perfect five-minute-facial which any woman can apply to be sure of immediate freshness. Some products carry the admonition that for best results they can be used as sparingly as fine perfume. With the freedom to travel, which everyone can now enjoy, Blocks of Indianapolis was the first store to give this idea a headline and a story of the important items for any trip. A mail order coupon aided quick purchase of the products.

PRESENT NEW MERCHANDISE WITH NEW APPEAL

How to present new merchandise with a new appeal has been used by Mandel Brothers, Chicago, which asked its customers to come in for a make-up. At the same time they may choose perfumes to suit a mood or an occasion. This store has a makeup bar in its rest-room. Excellent sales are made on products offered.

Current cosmetic business is strong and steady in treatment lines, although where stocks are not adequate there are general reports that things are slow. With income tax time past, an immediate pick-up is expected. Some of the advertising of treatment lines stresses the fact that if the product is used as directed it will relieve and ease the tautness of a skin that has been caused by a Winter of cold winds.

Progress in Essential Oils and Perfumery Products

The author presents a comprehensive review of the developments in research during the past
DR. PAUL Z. BEDOUKIAN* *year in the field of essential oils, perfumes, and synthetics*

ARTEMISIA ketone (2,5,5-trimethyl-1, 6-heptadiene-4-one) has been synthesized and its cyclization product studied.⁵⁷

RESEARCH IN TERPENES

A new aliphatic terpene alcohol having two isoprene groups attached tail to tail has been synthesized, along with other similar alcohols, and their odors reported.⁵⁸ A method of distinguishing terpene hydrocarbons containing 3,4, and 5 membered rings within a 6 membered ring, has been described.⁵⁹ Catalytic high temperature isomerization of terpene type compounds has been investigated.⁶⁰ Pinene has been found to react with formaldehyde to give a complex product, nepol. An interesting study of the reactions of this product has been made.⁶¹ Ascaridole has been synthesized from alpha terpene through a photochemical reaction, using chlorophyll as an activation pigment.⁶² A total synthesis of thujone has been reported.⁶³ The structure of carvone has been established to be 1 (6), 8 (9)-p-menthadiene-2-one, by means of Raman spectra studies.⁶⁴ Oxidation of camphene gives higher yields of camphor if the process is carried out in an emulsion phase using naphthenesulfonic acid as an emulsifier.⁶⁵

The main constituents of East Indian sandalwood oil have been separated by repeated fractional distillation. The lower fractions comprising 4-6 per cent were tricyclic alpha santalene and bicyclic beta santalene. The chief ingredients, tricyclic alpha santalol and bicyclic beta santanol, could not be separated by simple distillation although repeated fractionations gave fairly pure samples. Partial degradation and synthesis of sanatsols were carried out.⁶⁶ The problem of the constitution of vetivone was brought nearer to solution by the synthesis of one of its degradation products.⁶⁷

Experiments dealing with new methods of synthesis of azulene have been described. A description of the synthesis of 2-ethyl azulene and 1,3,4,8-tetramethyl azulene

(This article is continued from the March issue of THE AMERICAN PERFUMER.)

* Compagnie Parento, Inc., New York, N. Y.

and related compounds, is given.^{68, 69} An account of the developments in the chemistry of odorous substances derived from hydroazulene has been published.⁷⁰

NEW PREPARATIONS OF AROMATICS

A new synthesis of aldehydes involves the hydrogenolysis of thiol esters in ethyl alcohol by means of Raney catalyst.^{71, 72} Aliphatic primary and secondary alcohols were successfully dehydrogenated with copper-chromite catalyst giving good yields of the corresponding carbonyl compounds.⁷³ An interesting series of aryl alkyl aldehydes were prepared by the dehydration of ethylene glycols.⁷⁴ A patent has been issued for the preparation of aryl alkyl aldehydes which depends on the vapor phase dehydro-halogenation of halohydrins of vinyl aromatic compounds. Thus, phenylacetaldehyde is prepared by the treatment of styrene chlorohydrin.⁷⁵ By altering the reaction conditions, acetophenone may be prepared from the same starting material.⁷⁶ Another patent describes the manufacture of acetophenone from alpha chlorostyrene.⁷⁷

Catalytic dehydration of benzyl alcohol yielded dibenzyl ether and other compounds.⁷⁸ A study of the manufacture of benzyl benzoate from benzyl chloride and sodium benzoate appeared recently.⁷⁹ Bromination of methyl eugenol gave a tribromo product, and the bromine atom in the nucleus was found to be in the para position to the methoxyl group.⁸⁰ The constitution of diisoeugenol has been investigated.⁸¹

A patent has been granted for the manufacture of indole from indoxyl.⁸² Another patent describes the preparation of a wide range of jasmone type compounds by the cyclization of substituted gamma-diketones.⁸³ A third patent involves the synthesis of 1,1,4-trimethyl-3-cycloheptene-5-carboxaldehyde.⁸⁴ This compound can be used for the synthesis of irone.

Improvement in the manufacture of vanillin from sulfite liquor was reported in a recent patent.⁸⁵ The chemical reaction of vanillin was the subject of two interesting papers.^{86, 87} Many substances having a pungent taste contain the vanillin molecule. The preparation of zingerone

from vanillin was reported in a patent.⁸⁸ A review of the methods used in assaying vanillin in commercial preparations appeared recently.⁸⁹ Esters of vanillic acid are reported to be powerful non-toxic preservatives.⁹⁰ An economical commercial method of preparation of coumarin from salicylic aldehyde and acetic anhydride has been described⁹¹ and patented.⁹²

Ionone continues to be the center of interest in connection with the synthesis of Vitamin A and related compounds. Numerous papers and patents have appeared on this subject during the past year. These investigations will ultimately be of value to the perfume industry. Conditions for the cyclization of pseudoionone by acidic reagents were investigated and reported.⁹³ The semicarbazone of alpha ionone was prepared and found to have a melting point of 143 deg. C.⁹⁴ The shift of the double bond in ionones, cyclocitral and irone under varying conditions was the subject of an exhaustive study.⁹⁵

Continued studies on the musk odor of some sterols revealed that only the androstane derivatives had a musk odor and alteration in the structure of the molecule destroyed this odor.^{96, 97} The structure of ambreine, a constituent of ambergris, was the subject of an investigation.⁹⁸ It is stated that ambreine is not an odor constituent of ambergris. Total synthesis of trihydroxy fatty acids and the formation of unsaturated macrocyclic lactones was reported recently.⁹⁹ Cyclodecane compounds have been prepared through the oxidation of decalin.¹⁰⁰

INDUSTRIAL APPLICATION OF TERPENES

Industrial research with a view to utilizing the vast quantities of pine oil derivatives is being continued. Many patents have been issued involving the isomerization of natural products into more desirable substances. Thus, pinene is isomerized into camphene by boiling with a silicate compound.^{101, 102} Bicyclic terpenes have been converted to monocyclic terpenes by heating with water at high temperatures¹⁰³ or in the presence of catalysts.¹⁰⁴ Pinene was converted to limonene by heating in the presence of organic acids or acid amides,¹⁰⁵ and was converted into acyclic compounds by means of high temperature pyrolysis.¹⁰⁶ Dipentene has been isomerized to p-cymene by high temperature catalytic treatment.¹⁰⁷ Similar changes were brought about by passing pinene over selected catalysts.¹⁰⁸ Oxidation products useful in the paint and varnish industry were obtained from highly unsaturated acyclic terpenes.¹⁰⁹ Hydrogen sulfide has been made to react with various terpenes giving substances suitable as flotation reagents and intermediates for the production of plasticizers.¹¹⁰ Similar products were obtained through a different process.¹¹¹ Numerous terpenes have been treated with a number of unsaturated alcohols giving a new group of terpene ethers.¹¹²

REVIEWS AND PUBLICATIONS

A new journal devoted to the perfume industry, named *Industrie de la Parfumerie*, appeared in Paris this year.¹¹³ "The Subtle Sense," a book which discusses in an interesting and able manner the sense of smell, odor and its role in life, was published this year. It will be a worthwhile addition to the bookshelves of all who are interested in perfumes and flavors.¹¹⁴

A number of surveys and reviews also appeared during

the year. These include a comprehensive review of the developments of the past year in the field of essential oils and synthetics¹¹⁵ and an exhaustive review on the synthesis of aromatic aldehydes.¹¹⁶ Phenyl ethyl alcohol was the subject of two articles.^{117, 118} Acetals of value in perfumes¹¹⁹ and the odor of sixty cyclic aldehydes¹²⁰ have been listed. A brief summary of developments leading to the synthesis of compounds having a musk odor was published.¹²¹ The importance of Darzen's synthesis in the production of perfumery chemicals was brought out in a review.¹²² Cyclamen aldehyde, which has become so important in the absence of hydroxycitronellal, was the subject of an article.¹²³

There were a number of surveys during the year supplying up-to-date information on essential oils. These are very valuable since they constitute an important source of information on new sources of oils and their properties. Surveys on Spanish essential oils continue. Oil of pennyroyal and marjoram¹²⁴ eucalyptus,¹²⁵ and oil of Rue¹²⁶ were the subjects of informative articles.

Production of Mandarin oil in Italy, Brazil and the United States was discussed, together with its value as a flavor oil. It is interesting to note that the American oil contained little if any anthranilate, whereas the oils produced in other countries have been shown to contain a considerable amount of N-methyl methyl anthranilate.¹²⁸ The production of oil of dill in the United States satisfied domestic requirements during the war. The properties, composition and uses of both dill herb and dill seed oils were discussed in a publication.¹²⁹

Interesting reports on Mexican linaloe oil,¹³⁰ Spanish pennyroyal oil,¹³¹ Sea Buchu oil¹³² and Russian juniper oil¹³³ appeared. A comparison has been made between the Brazilian Ocotea Cymbarum and U.S.P. Sassafras oils. The Brazilian oil is used in the manufacture of heliotropine and is reported to possess a superior flavor value.¹⁴⁴ Constants of the oil of Patchouli from Nyasaland have been reported.¹³⁵

Now that orris is again available, readers will be interested in an article which describes its cultivation and the production of oil from this valuable source.¹³⁶

Variations in the oil content of orange peel in relation to maturity and size of fruit were discussed recently.¹³⁷ It is claimed that the yield of oil is increased several fold by treating the peels with calcium or barium hydroxide.¹³⁸ A first hand report on the efforts made in Brazil to develop an essential oil industry was published.¹³⁹ It lists in addition to the already established mint cultivation, the production of Brazilian Patchouli, jasmin, tuberose, geranium, and a valuable extract from the glands of the crocodile.

Several reports have appeared on the irritant properties of essential oils and aromatics. Lemongrass oil has been found to be a strong skin irritant,¹⁴⁰ whereas the ionones were found to be non-irritating. A number of essential oils and aromatics were used in patch tests and the results reported.^{141, 142}

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Letters to the Editor

Dear Fred,

I was delighted to get your interesting letter. Since you wrote on the 14th, the weather got steadily worse and, as you know, the fuel crisis came to a head and the position is still grave and all factories, after two and a half weeks, are still without electricity, the elements doing what the V.I's and V.2's failed to do—bring all industry to a standstill. Now I hear that we shall have to work factories at night, one week in every three! Will women do it, I wonder? I think they will, for everyone is so accustomed to doing what they are told. There is scarcely a country in the world so well schooled these days: the war has made them this way, although it was a national trait.

You may be interested to know that in my office I now work with two oil lamps, except between 12:00 noon and 2:00 p.m., the permitted hours for light; We have no heating all day and the temperature for the last two weeks has been between 45 deg. and 51 deg. in my office. I am quite used to the cold and anyway I am sure it is healthy! The trouble is that we are all short of coal at home and most of us have had no hot baths, owing to frozen pipes, etc.

Without power in the factory, it has not been easy, but Howard has had coke fires in buckets to heat tanks of water in order to melt the lipstick waxes and base, etc. We leave stainless steel containers in the boiling water. It is a bit slow, but it works! Lipsticks are, of course, made by hand and we still receive some metal cases.

Face powder is being sifted by hand and we run the mill by pulling the belt by hand to grind the colour, etc.: it does two or three thousand less that way, instead of 7,000. We fill powders by hand, a slow and messy job, but necessary. Our wartime temporary factory has now closed completely, so I brought over our perfume filling staff to Neasden as I was determined to carry on. We can fill by hand with the hand fillers we had all through the war. Production is much down but at least we are working and getting some orders out. Most of our competitors are completely closed. We do not know yet when we can resume with electricity. Our main trouble is that all main suppliers are closed and it will be some time before we receive any more boxes, tins and even some raw materials. However, there is usually something in our range we can proceed with.

All the same, this month of February must have rather widespread repercussions for two or three months ahead, at least. The weather has been quite abnormal all over the country for a longer period than ever before and traffic has been absolutely held up on rail and road. My car froze twice on the way to London the day before yesterday and several times my rear wheels have frozen stiff and would not turn, except with hot water over the brake drums.

I am taking advantage of the lull to move over more stocks and staff from Leyton, although we are not ready really to receive them at Neasden. It is a sound move.

With best regards to you all,

Yours ever,

BOB.

* Composed from a letter written to Frederick E. Shoninger, President of Antoine Chris Co., Inc. by Robert Dyas, Managing Director of J. Grossmith & Son, Ltd., and submitted by him to THE AMERICAN PERFUMER.

Packaging

Portfolio

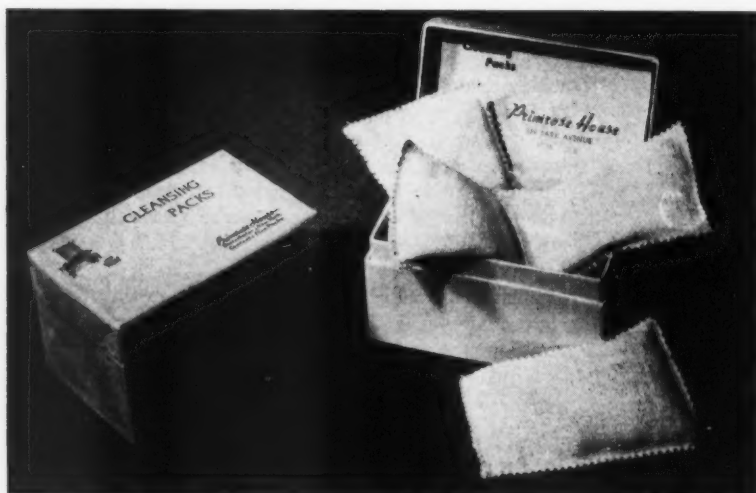
PRINCE MATCHABELLI



PRINCE MATCHABELLI: Summer Frost suggests a garden, swimming pool, and a long frosted drink, the identifying scene of the new Prince Matchabelli package in gay blues, greens and soft red. The cologne itself is lime-colored and has a just-off-the-ice look in a specially frosted version of the familiar flask bottle.

PRIMROSE HOUSE: The Primrose House cleansing packs are medicated herbal packs to be dipped in warm water and used like a face-cloth. The little individual packs come in a cream colored box with black print and the familiar little red door on the cover.

PRIMROSE HOUSE



BARBARA GOULD: A floral fragranced Skin Sachet in a modern bottle with gold foil label and plastic cap bowed with flame red ribbon is now presented by Barbara Gould.

BARBARA GOULD



COTY

COTY: Asuma by Coty reappears in its spherical Lalique bottle of pre-war days. It is now encased by a new gold, octagonal box with Chinese red panels of oriental motif.



MARIE EARLE: A charming gift idea is a trio of sachets with the little Marie Earle Ballerina scented cushions concealed beneath chartreuse and blue ballet skirts. The sachets may be suspended from hangers by blue satin ribbon cord.

MARIE EARLE

POND'S: "Angel Face," Pond's new makeup, is a striking combination of Pond's blue-green and gold. The lower half of the box features the Dreamflower pattern. The package comes with a double-face velour puff.



DANA: Dana introduces Emir, a Paris created perfume. Emir comes in a flat-topped scalloped bottle with an accentuated shoulder and a long flat base. The perfume is topped with a clear rectangular stopper. The label is done in grey.

POND'S

DANA



Short Adages

R. O'MATTICK

PARIS is always associated with the World of Perfumes! We mean Paris, France, and not Paris, Tennessee. But the other day, while looking into an Encyclopedia to find a map of the French Capital in order to locate a region near Place de Vendome, our eye went down the page and we ran into that other Paris in Tennessee. We were pleased to read that the little town of Paris, about 130 miles northeast of Memphis, is recorded in the Encyclopedia and that note is made of the fact that "its chief manufactures are toilet goods." There is probably no other town, city or village in the United States which has this distinction.

* * *

We have always held to the theory that the wheel of Fashion does not merely turn but that it spins in the matter of Perfume Scents. We recall the days when everyone wanted a Gardenia odor—even makers of Para Blocks and of Sprays were all out for Gardenia. Then woodland odors and woody odors and woody odors came into vogue and no one wanted gardenias anymore. Are Gardenia odors coming back? It may be too early to say but the trend (a most favorite word in our business) is pointing (another favorite word in our business) that way.

* * *

It is natural to assume that the name Gardenia comes from garden because the flower is the quintessence of the garden. The name comes from garden but not for this reason. The flower was named after Dr. Alexander Garden, an American naturalist of South Carolina, to honor him for his work with flowers and plants. (This we also picked up in the Encyclopedia!)

* * *

It is a very far cry from Gardenias to Salad Dressings and Mayonnaise but the poor Essential Oil men must think of everything or nearly everything into which Essential Oils go to keep their heads above water. They have to supply the oils for fine Gardenia Bases and also the oils for flavoring Mayonnaise and Salad Dressings. Now along comes the Food and Drug Administration and says it does not want food products containing spice essential oils to be labeled as having been flavored with spices. They are satisfied with the term "Spice Flavoring." We are satisfied with any flavoring as long as it is good and put into a good product. We think, if we may say so, that the FDA is splitting hairs and not just ordinary thin hairs but those almost ultra-microscopic hairs found on some very tiny spice seeds from which good flavors are made.

* * *

So this, then, is the great question of the century. We



like Mayonnaise and we like it flavored. We know that it is simpler to use spice oils for flavoring than it is to use spices. As for the rest, we welcome the learned opinions of our readers who are interested in sugar and spice and shall gladly let them avail themselves of the freedom of the press and the hospitality of this page to express their thoughts on this momentous subject.

* * *

Our own belief is that the time is near at hand when buyers will begin to buy again. They cannot keep on saying "No" and just complaining forever because the goods on hand, however large, are not endless. Mr. A. Goodbuy says that he feels quite futile right now as the Head of the Purchasing Department of his firm. "In the Pre-War days I used to purchase," he volunteers, "then when shortages were shortages I used to purr and chase—now I chase away suppliers except for those items which are still short." He told us in confidence (and for this reason we omit the quotation marks on this part of his statement) that more items are short than he is willing to pretend!

* * *

"The situation will clear up," stated Mr. Pat Chouli. "A correction is taking place, as they say down Wall Street. We are correcting everything, including the way we talk to customers."

* * *

This trend was also noted by our good friend, Dr. Row-maternal. He claims that suppliers who always answered the phone by saying "No" instead of "Hello" now inquire about the state of his health. "I cannot say I resent this," he continued. "I find myself asking about the health of our customers. How is your health, by the way?"

* * *

Now that the economic situation has been fully covered, we move into the field of politics. In view of the fact that the speaker of the evening at the Drug Trade Dinner in March was a Senator from Maine, who said it was not necessary to wonder about the political party to which he belonged, might not the Toilet Goods Association invite for their Convention in May a Senator from the deep South to say that it, too, is not necessary to wonder to what political party he belongs?

THIOLYCOLIC ACID, although discovered by Carius in 1862, only within the past five years has thrust itself, in the form of thioglycolates, into the range of activities of the industrial hygienist. Because of their action on hair (human and animal), the thioglycolates have achieved prominence, and chiefly so in the procurement of artificial curling of human hair ("permanent waving"), and artificial straightening of hair. These hair modifications call for different procedures, possibly embracing use of ancillary chemicals as primers, neutralizers, and fixatives, thus complicating hygienic appraisals.

Women, beginning at an age near 15, provide a continuing patronage for "permanent" hair waving, if Caucasian, together with hair straightening in smaller numbers of Negroes. This patronage is either for beauty shop services or for substances designed for home application for such hair modifications. "Permanents" for children are becoming increasingly common.

It is estimated that yearly 55,000,000 (approximation) permanent waves are secured. For the women who favor this beauty effort, the yearly average is near three.

The early professional curling depended almost entirely upon the hot process. In this, heat, either from numerous electrical units or chemical cartridges in contact with wrapped wisps of hair, softened the hair shaft, with retention of the curled state on subsequent solidification. Nearly five years ago the cold wave process came into vogue. No apparatus is required beyond rollers so that both in homes and beauty shops this process is suitable and convenient. Some 25 per cent of all permanent waving is done in the home, thus obviating professional services. The factor of safety justifies the purveying of lower strength waving materials, and thereby the necessity for more frequent waving. Some cold wave materials manufacturers point their product solely to home use. Such is the case with the brand name, "Crowning Glory," which identifies the product with which the major portion of the present study has been conducted. This product has as its active agent a buffered, stabilized, sodium thioglycolate. The majority (total near 40) rely upon ammonium thioglycolate. In the early days of the cold wave process, simple mineral sulphides were employed. These freely decomposed with the liberation of so much hydrogen sulphide as to constitute a practical threat to health and even to life, for those exposed. These sulphides were abandoned.

Industrial hygienic concern in cold waving obviously is limited to the professional operator in the beauty shop. On a much lower scale, whatever is detrimental to the shop operator may appear in the household user. Manifestly, the level of exposure is markedly different. The housewife, more or less once in three months waves her hair, requiring some three or four hours of time. Contrariwise, the professional may render such services daily to some six or eight women. Moreover, the professional handles in addition to cold wave materials, a score or more of others requisite to the cosmetic trade. Undeniably, the beauty shop may be a fruitful source of dermatitis. The culpating arrow from period to period points to divers classes of substances as the cause. At this very time the thioglycolates are suspected as the sources of much dermatitis and in addition, some claims allege all manner of systemic disease, with

CAREY P. McCORD, M.D. *Chemistry and physics of hair waving, thioglycolates and their direct action on the hair are discussed*

PROPERTIES OF Thioglycolates

liver and renal damage, paralysis, blood dyscrasias, and kindred affections. Such is the situation for industrial hygienic exploration.

CHEMISTRY AND PHYSICS OF COLD WAVING OF HAIR

What occurs when cold wave solutions appropriately are applied to growing hair is no simple happening in chemistry and physics. A less complex analogy may be found in the laboratory when a straight glass rod or tube is heated and bent into any desired shape. The end product involves no destruction, no alteration in the tube's bore or strength. Indeed, this glass object is much the same except for shape. The similar but more involved happenings in permanent waving through the cold solution process have been so well delineated in comment in the *Technology Review*¹ that the entire editorial is here quoted:*

ARTIFICIAL HALO

"No sonnet now upon milady's eyebrow, but the subtleties of Science expended on the undulations of the damsel's tresses. The structure of organic molecules, their reactivity, the latest speculations on the inner texture of fibers, and substances synthesized from ethylene gas, by-product from the manufacture of gasoline by the cracking of petroleum—all these are applied in the ingenious 'cold wave' process whereby the hair is given a permanent crimp without recourse to heat. After the fact it is difficult to determine whether theoretical considerations produced the process or, the process having been worked out empirically, it was found to submit beautifully to scientific explanation. At any rate, the cold wave sends its roots into the profundities as deep as many a million-dollar triumph of modern chemistry.

"Hair is a protein fiber, a bundle of long protein molecules intertwined with one another and linked together crossways at intervals. In the cold wave process, the cross-links are broken, the fibrous bundle is bent to the shape which is to be permanently imparted, and cross-links are

From The Industrial Health Conservancy Laboratories, Detroit, Michigan. Digested from *Industrial Medicine*, December, 1946.

* Reprinted from the *Technology Review*, edited at the Massachusetts Institute of Technology.

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established again by new combinations of the parts of the original cross-linkages. As simple as that: The new linkages hold the bundle of molecules in the new shape.

"Proteins are condensed amino acids, long molecules formed by the linking together seriatim of amino acids, the acid end of one molecule being condensed with the amino end of the next, and so on, and so on. The amino acids are alike in the respect that they all contain an acid group and an amino group, but they are not all alike in certain other details of the arrangements of their atoms. One of them in particular, cystine, which constitutes about 15% of the protein of hair, is made up really of two amino acid molecules linked together crossways by a bridge or link of two sulphur atoms. Every cystine residue in a protein thus establishes one cross-link between two series of condensed amino acid molecules. Another cystine residue may cross-link the two series in another place or it may link each of the series independently to another one. The cross-links each grasp only two of the ultimate units of the fiber, but the links are so numerous and so well distributed that they give the bundle a certain pseudo-rigidity of its own, a resiliency, a shape to which it returns of itself when released from any stress which may have distorted it.

"Cystine is split by the action of appropriate reducing agents; the sulphur-sulphur linkage ($-S-S-$) which holds together the two halves of its molecule is opened up, hydrogen atoms are introduced, forming $-SH$ groups, and two molecules of cysteine are formed. The same thing happens to the cross-links of the hair fibre under the action of such materials as sodium sulphide, beta-hydroxyethylmercaptan, ammonium thioglycolate, and so forth. These are depilatories which soften the hair and, if allowed to act long enough, finally disintegrate it. Also, their offense is rank; they smell to high heaven. For cosmetic use they require to be camouflaged by perfumes which cover their disagreeable odors until art's hid causes are no longer found, and all is sweet, and all is sound—at least as far as the chemistry is concerned.

"Suitable oxidizing agents convert cysteine back to cystine; the hydrogen atoms are removed from the $-SH$ groups, and the sulphur-sulphur linkage is restored. Hydrogen peroxide and sodium perborate are benign oxidizing agents which have been used to restore the cystine linkages in hair which has been softened by depilatories.

"The essential steps in the official cold wave process are about as follows. The hair is first washed thoroughly with a detergent solution containing an effective wetting agent either with or without a quantity of a depilatory material. This is to remove any oils or fatty substances which would tend to inhibit the softening process and, perhaps also, to produce a preliminary and partial softening. The hair to be waved is then wound on pegs where it is held in place by little clamps, and now it is treated, while under stress, with the agent which opens up the cystine linkages. The operator at this point sometimes tests the action of his solution on a selected sample of the hair in order to determine how long it is desirable to let the solution act. When the hair has been softened sufficiently, it is treated with the oxidizing material which establishes new cystine linkages at the places which have been brought into juxtaposition by the winding on the pegs. The hair is then unwound from the pegs, washed thoroughly, and thereafter treated as the taste of milady may dictate.

"By the cold wave process nothing is added, that is, nothing material, nothing except that immaterial and elusive something: She's gorgeous! She's enchanting! and so forth. Nothing is taken away, not even an atom. The original atoms have been coerced by chemistry into new arrangements giving the hair a new and enduring sinuosity."

MATERIALS AND PROCEDURES OF COLD WAVING OF HAIR

At the present time the chief materials utilized in cold waving are thioglycolic acid, $HS.CH_2.COOH$, which may have a small associated content of dithioglycolic acid, $(SCH_2.COOH)_2$, and thiodiglycolic acid $S(CH_2.COOH)_2$, all of which are modified to thioglycolates, the commonest of which being the ammonium thioglycolate ($HSCH_2CO_2NH_4$). No single formula will indicate the practices of all manufacturers of cold wave chemicals. The following formula is representative:

—4 per cent (by weight of final product) of thioglycolic acid (100 per cent). Sufficient alkali (e.g., ammonium hydroxide) to neutralize. Approximately 2 ounces of essential oil of choice) for perfumery. Sufficient quantity of distilled water to produce 100 gallons.

A pH value between 8.8 and 9.2 appears to be optimal.

THIOGLYCOLATES THROUGH PRE-FABRICATION

Some thioglycolates are available to the cosmetic manufacturer through pre-fabrication. These may only require dilution, de-odorization, and possibly increased alkalization. Protection from the well-recognized toxicity of thioglycolic acid fully depends upon the integrity of the cosmetic manufacturer, either in his choice of basic material sources or in his own thioglycolate compounding. The original thioglycolic acid may be vended in various strengths (i.e., percentages); the ammonium hydroxide, if such be employed, in varying Beaumé or specific gravity values. Unless every batch of cold wave material is conditioned to these variations, opportunity for damage to both operator and consumer may arise. Mere adherence to fixed formulation is open to errors. Every batch should be standardized with an accurate pH meter and reliance should not be placed on test papers. An analogy may be found in the simple titration of hydrochloric acid with sodium hydroxide. If in an assumed chemical system, 25 ml. are required for complete hydrogen ion adjustment, it might be assumed that 24 ml. might nearly suffice. Quite to the contrary, 24 ml. might elevate the pH only somewhat above 2 units, while 25 might extend this unit value to 11. Unless the manufacturer of cosmetic thioglycolates precisely neutralizes the strong thioglycolic acid, he may be inviting disaster for his product, for the operators using his product, and for the consumer to whom the product is applied. It is not known that any product for cold waving directly resorts to thioglycolic acid, as such, and the belief is that all solutions based on thioglycolic acid have been alkalized. No less, opportunity still may exist for the presence of some thioglycolic acid or kindred acid, on a decomposition basis, and otherwise conceivable over-alkalinization may occur.

NEUTRALIZING SOLUTION

Subsequent to the application of thioglycolate to the hair, later to be mentioned, various neutralizers, fixatives, or setting agents may be employed. Perhaps no two manufac-

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turers furnish identical materials. Therefore, again the formula shown is but an example:

Neutralizing Solution:	
0.5 oz.	Ortho-phosphoric acid 85 per cent
3.5 oz.	Acetanilid USP powdered
640 oz.	Hydrogen peroxide 100 volume
q.s. 51 gallons	Distilled water

Acetic acid is sometimes substituted for phosphoric acid. When neutralizers are supplied in the unit package, the requirement is ordinarily for much higher dilution. Greater detail relative to analysis of cold wave solutions may be found in a publication by Dahle and Newburger.²

Procedures involved in cold waving are not uniform. The following presentation represents the steps more nearly common to all products intended for home use. Some manufacturers warn that bleached or dyed hair may react aberrantly. A few manufacturers recommend a single test curl to determine the appropriate duration for a given individual.

First, a thorough shampoo of the hair with complete removal of the soap but do not allow the hair to dry.

Arrange the hair so that it falls into numerous strands. Apply separately to individual strands of the still wet hair small quantities of the thioglycolate preparation. Then wind the strand around a curler, ending in a tight curl wrapping.

When all strands are in place, more of the thioglycolate should be added to all curls consuming the entire contents.

After this, the entire hair area is wrapped by a towel and allowed to remain in place for the appropriate time, which ordinarily is from three to three-and-a-half hours. At the end of this time, with the curlers in place, the hair is well moistened with tap water.

Immediately afterwards the diluted neutralizing agent is dabbed on the curlers. After this step the curlers are removed and the hair again rinsed in tap water, then rinsed with the remainder of the solution.

Thereafter the arrangement of the hair may be made to conform to the wishes of the user. If any thioglycolate or neutralizer should remain, this should be discarded.

PHYSICAL AND CHEMICAL PROPERTIES

Thioglycolic acid never appears as such in cosmetics, or at least should not appear. The industrial hygienic problems of thioglycolic acid essentially are limited to the manufacture of thioglycolic acid and thioglycolates. The physical and chemical properties of thioglycolates are easily established, reference customarily being made to the parent substance. This custom is here followed.

Thioglycolic acid (spelled either with one or two final ls), $\text{HS.CH}_2\text{COOH}$, mercaptoacetic acid, produced (one way) by heating chloroacetic acid with potassium hydrogen sulphide; molecular weight 92.09; sulphur 34.31 per cent; a colorless liquid; strong, unpleasant skunk odor; specific gravity 1.325. Melts -16°C , boils $104-106^\circ\text{C}$. (15 mm). Dissociation constant, Ka^{25° .

$$2.85 \times 10^{-4}$$

On heating, thioglycolic acid yields thioglycolide, SCH_2CO .

For identification, see Jones, *J. Assoc. Official Agricultural Chemists*, 27:574 (1944). Chief thioglycolates: NH_3 , Ca, K, Na, Bi, Sb. Mulvaney (*Proc. Sci. Sec. Toilet Goods Assoc.*, May 17, 1946) has reported more extensively on the physical and chemical properties of thio-

glycolic acid with particular reference to decomposition; the ill influence of the presence of any iron, manganese, or copper; the ease with which dithioglycolic acid may appear in commercial waving solutions. This author is now quoted:

"The solutions of thioglycolic acid—more specifically, the dilute solutions of ammonium thioglycolate of pH above 9, which until recently have been used for cold permanent waving—have been consistently reported to be unstable. Because of this poor stability, the shelf life of these waving lotions was very short and the resulting waves, if any, were completely unpredictable. To complicate matters further, no two batches of thio-acid from the same manufacturer behaved in the same way. Extensive research, however, has shown that a pure acid of uniform quality may be produced on a commercial scale at approximately one-third the market price of several years ago. The contaminants responsible for the instability of the acid have been recognized and means to eliminate them have been devised."

THE HYDROGEN SULPHIDE SITUATION

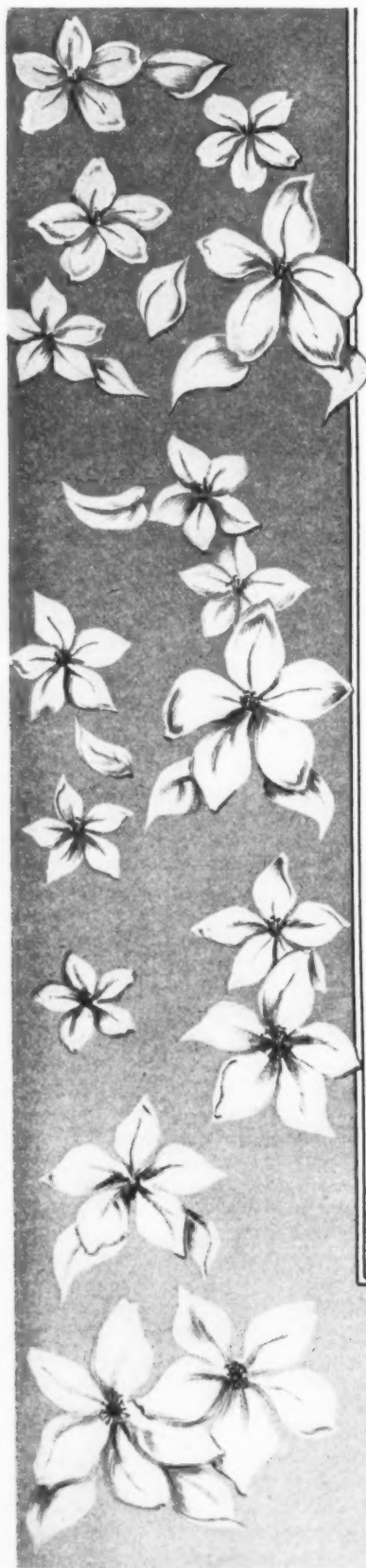
It is known that thioglycolic acid tends to decompose with the formation of hydrogen sulphide as one product. If all of the sulphur in the thioglycolic acid molecule were to be transformed into hydrogen sulphide, which is unlikely, 1 ml of 100 per cent thioglycolic acid might provide 344 parts of hydrogen sulphide in the air of 25 cubic feet. At an earlier time,³ question was raised as to the possibility of evolution of sufficient hydrogen sulphide, under the usual circumstances of permanent waving, to account for the systemic disease allegedly deriving from such exposure on rare occasion. Answer to that query possibly may reside in this section.

The toxicity of hydrogen sulphide is such that the standard for prolonged exposure devised by the American Standards Association is 20 ppm for standard conditions. If it may be assumed that every adult breathes approximately 1 meter of air per hour, it follows that at this tolerated level of 20 ppm of air, 27.8 mg. of hydrogen sulphide entering the body still falls within the safe limit. If the permanent waving process does not extend beyond 4 hours, which appears ample, 111.2 mg. of hydrogen sulphide might be tolerated. Therefore, the question involved is whether under any ordinary circumstances of permanent waving, those exposed might have imposed on them hydrogen sulphide in excess of 111.2 mg. for customers or 222.4 mgs. for the operator working an 8 hour day.

Commercial thioglycolic acid (about 84 per cent), standing in half-filled bottles, may give rise to some 200 ppm of hydrogen sulphide within the bottle. Should this be removed, as much as 10 ppm may reappear in 10 minutes. In the superimposed air, all tests being made with the silver cyanide method employing hypersensitive tubes.

In the case of thioglycolates in the form of commercial hair waving preparations, similar tests for hydrogen sulphide indicate concentration from 2 to 20 ppm in the air above the liquid levels in containers. It follows as possible that large evaporating surfaces, such as provided by the hair of the head, or heat, or air oxidation, or chemicals of the hair, might so act as to accelerate this decomposition to dangerous levels of hydrogen sulphide.

Into a five-gallon glass bottle was introduced glass wool in quantities approximating that of a woman's hair. Upon



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this was sprayed thioglycolic acid and thioglycolate in quantities comparable to those used in permanent waving. At times this arrangement was brought to higher than body temperatures, was subjected to the action of oxygen; clipped rabbit hair was substituted for glass wool. Under all such conditions tests for hydrogen sulphide were made and at no time did the level reach 5 ppm.

A chemical system was provided consisting of suction pressure, a flask for holding a content of thioglycolic acid and thioglycolates, including several commercial waving preparations, which flask in turn was connected with a condenser, and then a train of flasks containing appropriate quantities of cadmium chloride. The content of thioglycolic acid or thioglycolate was subjected to various modifications such as oxidation, heating, boiling, acidulation, was admixed with hair, etc. The suction system led to the bubbling of all liberated sulphur compounds through the cadmium chloride train, and later appropriate determinations were conducted. Always the objective was to measure any unusual release of hydrogen sulphide potentially detrimental to those exposed.

METHODS

McHattie and MacNiven⁴ have devised procedures for the partitioning of various forms of sulphur likely to be encountered on chemical analysis.

These are sulphur oxide, mercaptans, thiophene, and carbon disulphide. In the present instance, concern was limited to mercaptans and hydrogen sulphide, the two being associated. The authors mentioned, in describing selective absorbents, stated with reference to mercaptans:

"Mercaptans are absorbed by the cadmium chloride reagent recommended by Shaw. The reagent is prepared as required by adding 10 ml. of 1 N sodium carbonate to 60 ml. of a 10 per cent solution of cadmium chloride. Hydrogen sulphide is also absorbed while thiophene, carbon disulphide, and carbon oxysulphide are not affected."

Later, after describing the apparatus employed, these authors indicate the method of mercaptan determination and calculation in the following language: "Ten ml. of concentrated hydrochloric acid are added through the joint and the absorber is shaken gently until the solution is free of precipitate. Ten ml. of 0.01 N iodine solution, measured accurately by an automatic pipette, are next added and the absorber shaken for a minute. Excess iodine is then titrated with accurately standardized 0.01 N sodium thiosulphate solution. A similar procedure is carried through on a blank solution and the difference between the two titrations with thiosulphate measures the equivalents of iodine consumed in the reaction with sulphides and mercaptides. Mercaptan sulphur is calculated on the basis that one atomic weight of iodine is equivalent to one atomic weight of sulphur combined as mercaptans."

Hydrogen sulphide interferes since it is also absorbed and each atom of sulphur present as hydrogen sulphide is equivalent in the reaction with iodine to two atoms of mercaptan sulphur. For low mercaptan concentrations, as calculated above, the interference is not significant since the chief importance of the determination is to establish the fact that the combined concentration of hydrogen sulphide and mercaptan is negligible. If it becomes necessary to differentiate between hydrogen sulphide and mercaptans, the differential titration method of Shaw is available."

As the matter now stands, the mercaptan sulphur and hydrogen sulphide have not been differentiated. To accomplish this Shaw has evolved a method relying upon Shaw sulphide flasks and utilizing the following procedures:

"Procedure B (determination of hydrogen sulfide alone). The sample is taken and the flask evacuated, as previously mentioned; chilling is omitted. At this point the solution in the sulfide flask is made just acid to methyl orange with 1 N hydrochloric acid, added through the groove in the stopper in the funnel top. (The methyl orange is put in the acid to be added.) Then 8.3 ml. of 1 N. hydrochloric acid are measured out and, together with an amount of water sufficient to dilute the sample to approximately 100 ml., are introduced into the flask in the same manner. The volume of solution is adjusted with water to 100 ml. and the flask is well shaken. The stopper is removed, a pinch of dry asbestos wool added, the stopper replaced, and the flask shaken again to facilitate filtration. At this acid concentration (3 grams of free hydrochloric acid per liter) the cadmium mercaptides are in solution and the cadmium sulfide is in suspension.

"The solution is then filtered through asbestos on a Gooch crucible (the bitumen size crucible is preferred) with moderate suction. The stopper is placed in the mouth of the flask, about 10 ml. of dilute hydrochloric acid (30 ml. of N hydrochloric acid per liter) are poured in the funnel top, the stopper is raised vertically, and the solution is allowed to flow into the flask. The flask is then shaken and the acid poured into the Gooch crucible. The open flask is next blown out to remove mercaptan vapors. The suction is kept on the Gooch filter only long enough to free the pad of loose water, whereupon it is immediately removed. The asbestos pad is rolled up with a stirring rod and transferred to the sulphide flask. A pinch of dry asbestos is placed in the crucible, made just moist, and used to wipe out adhering cadmium sulfide; it is then transferred to the flask, the stopper is inserted, and the flask is evacuated. Ten milliliters of concentrated hydrochloric acid are added, followed by enough water to dilute to about 50 ml., and the whole is shaken to disintegrate the cadmium sulfide precipitate. A measured amount of standard iodine is added in slight excess and the excess iodine is titrated with thiosulfate.

Calculations, Procedure B.

$$(\text{Net ml. of 0.1 iodine}) 0.0017 \times 15.43 \times 100 =$$

Cu.ft. of gas in sample (corrected)

grains of H₂S per 100 cu. ft. of gas

Then

(Net ml. of 0.1 N I₂, Procedure A) —

Cu. ft. of gas in sample (corrected)

(Net ml. of 0.1 N I₂, Procedure B)

Cu. ft. of gas in sample (corrected)

$$\times 0.0032 \times 15.43 \times 100 =$$

grains of mercaptan sulphur per 100 cu. ft. of gas"

In our own work the total sulphur as represented by mercaptans and hydrogen sulphide was so low as to make further separation valueless.

¹ *Technology Review*, 47:483, June, 1945.

² "Methods of Analyzing Cold Wave Solutions," *The American Perfumer and Essential Oil Review*, February, 1945, p. 35.

³ *J.A.M.A.*, 131:776, June 29, 1946.

⁴ *Canadian Chem. and Proc. Ind.*, 30:87, July, 1946.

(This article will be continued in the May issue of THE AMERICAN PERFUMER.)



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FLAVORS

Catalytic Aging of Whiskey

The great interest in rapid aging of alcoholic beverages is evidenced by the surprising number of methods that have been proposed and patented for this purpose

MORRIS B. JACOBS, Ph.D.*

IN previous articles in this series, the major categories in which the methods of rapid aging of whiskey may be placed namely, mechanical, physical, reduction, oxidation, and miscellaneous methods were noted. The oxidation methods may be classified under the headings of (a) treatment with oxidizing gases such as air, oxygen, ozone or nitrogen dioxide-nitrogen tetroxide mixtures; (b) treatment by electrolysis; and (c) catalytic methods. Those in groups (a) and (b) have been previously discussed.

Catalytic Methods.—The artificial maturation of liquor is helped by use of catalysts. In general catalytic oxidation methods are carried out using the vapors of the alcoholic beverage. Thus the vapors may be passed over finely dispersed metal oxides¹ such as those of copper, nickel, and titanium at 150 deg. to 180 deg. C.

The oxides of cobalt, cerium, vanadium, and uranium are suitable catalysts for oxidation.² The oxides of lead, molybdenum, silicon, uranium, and cerium are catalysts for ester formation. While the best flavors are produced by the use of oxides of lead, copper, nickel, molybdenum, cobalt, titanium and silicon.

In addition to their use in elution and absorption methods, charcoal and charred sawdust have been found to

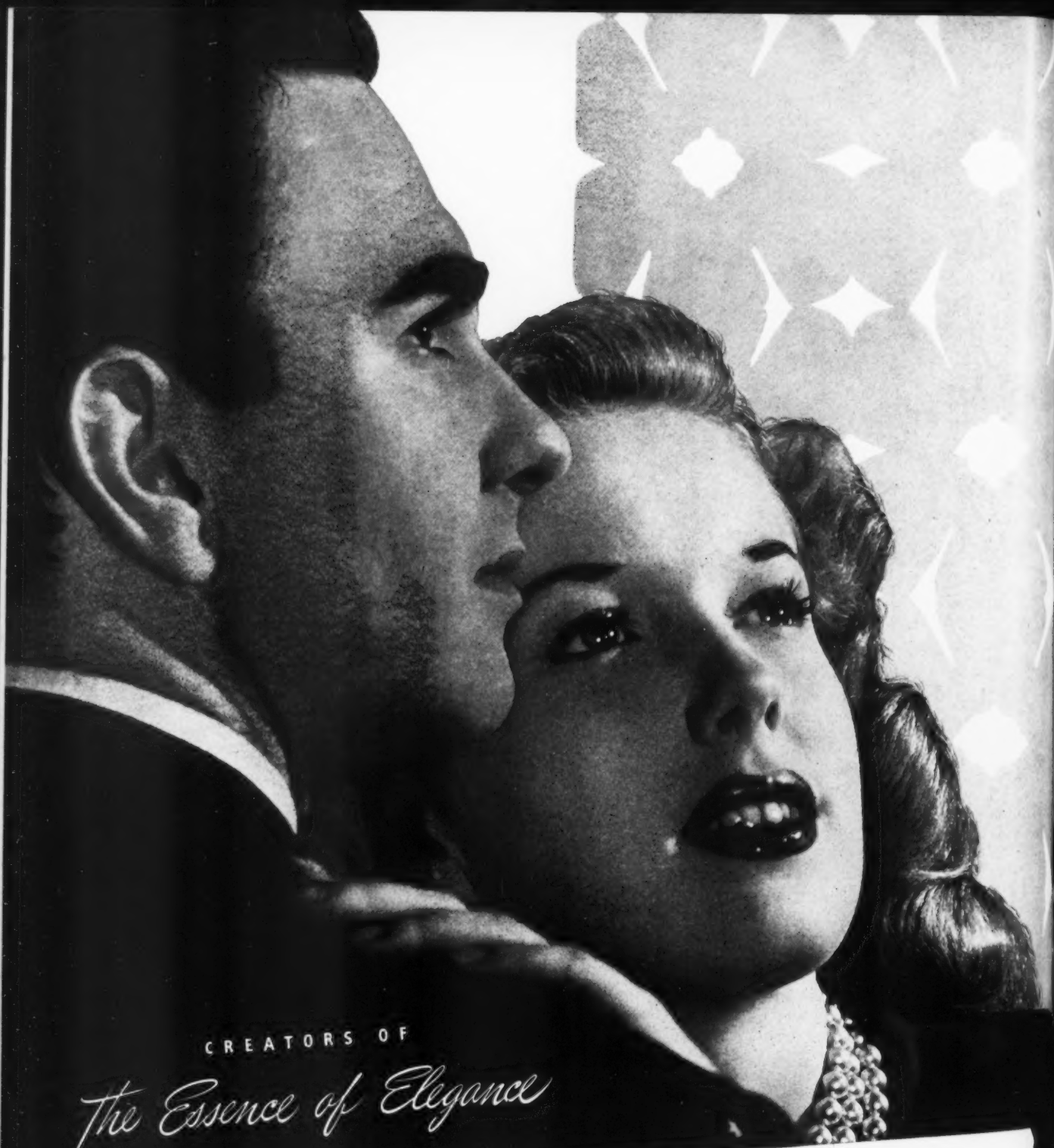
catalyze the aging of spirits. The rising vapors, inside or outside the cask, may contact catalytically acting charred sawdust or charcoal³ without the catalyst, however, coming in contact with the liquid. Other catalysts may be employed in this way, alone or together with the charcoal or charred sawdust. Note below the method in which activated carbon probably acting as a catalyst is used in combination with the distillation method.

A different method⁴ for maturing potable alcoholic beverages is to mix the vapors arising from a pot still with heated air, subdivide this mixture into narrow streams, and pass these through a narrow conduit heated to about 150 deg. C. The streams are joined and the treated vapors condensed. The heated metal walls are supposed to act catalytically to produce the desired result.

MISCELLANEOUS METHODS

Distillation and Oxidation.—There are a number of other methods of maturing whiskey that have been proposed. Thus a process⁵ for converting the undesirable aldehydes normally present in raw beverages comprises fractionating the raw liquor, removing a portion of the heads from the fractionating zone, digesting these heads with sulfuric acid-potassium permanganate solution to bring the conversion of aldehydes to esters, removing the digested mixture, and separating by distillation the alco-

* Adjunct Professor of Chemical Engineering, Polytechnic Institute of Brooklyn.



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hols and esters desired from the heavy polymers which are also formed. The alcohols and esters are then returned to the fractionating zone thus increasing the amount of total esters.

The following is a variation of the distillation and oxidation method combined with the catalytic carbon method.⁶ Finely divided oak in the proportion of 1.5 to 2 per cent is introduced into the liquor whose maturation is being accelerated and the more volatile and some intermediate components are distilled off to a point where most of the alcohol has been distilled off. The less volatile undistilled residue is brought into contact with oxygen. The intermediate fractions in vapor form are brought into contact with an activated carbon and then the distillate is condensed and recombined with the residue.

Separation and Oxidation.—There are several variations of the separation and oxidation methods. Actually the distillation methods mentioned above could also fall in this category. In one procedure⁷ the congeneric substances of alcoholic liquors are concentrated on a solid absorptive material such as beech shavings and the principal part of the beverage is separated from the concentrate. The congeneric substances in the concentrate are then subjected to oxidation with a stream containing gaseous oxygen for at least an hour but not longer than eight hours. The oxidized concentrate is subsequently returned to the main body of the liquor.

Liquors have been aged⁸ by separating the water and alcohol, and subsequently removing the fusel oil from the concentrated residue by use of petroleum ether. The concentrated extracts can then be subjected to accelerated maturation by one of the procedures described in the above sections. After treatment the residue is again combined with the alcohol-water portion.

Extracts.—In certain processes extracts are prepared which when added to the main body of spirit serve to age it. Thus for instance waste wood obtained in making casks or from the heart of large oak trees is disintegrated and extracted twice with aqueous alcohol and a third time with water. The combined alcoholic extracts are distilled in vacuo at low temperature and the residue is added to the aqueous extract. This mixture is evaporated under vacuum to obtain a dry solid which is added to the liquors to be aged.⁹ These methods have also been mentioned by Fain and Snell.¹⁰

In a different process¹¹ hot whiskey vapors are taken directly from a still and are passed through wood shavings having a lower temperature than that of the vapors. These condense on the shavings, extract the alcohol soluble materials together with the tannins and subsequently flowing hot vapors vaporize and displace the prior condensate with the extracted material. The remaining vapors and condensate are collected and cooled and the total condensate is collected to be returned to the main body of liquor.

One of the less scientific methods for accelerating the maturation of whiskey was aging for comparatively short periods of time in old sherry wine casks. This method was claimed to be very effective. It is also probably one of the least objectionable. As a variation, the casks could be subjected, before filling with whiskey, to a forced seasoning. The process consists of placing the casks bung down and drying them thoroughly by forcing a current of warm air

through the bung hole. Then enough wine to wet all the inner surface is poured into the cask, the cask is revolved to coat all the wood and the wood is impregnated by forcing in warm air under pressure. The whiskey in turn extracts the congeneric substances formed from the cask.

Microorganisms.—Methods differing from those described above utilize microorganisms. These are methods principally designed to process oak wood which is subsequently used for the rapid maturation of alcoholic beverages. Oak wood is comminuted, toasted to dehydrate the tannins and a prolific growth of cryptogamic spores is induced by moistening the wood with a solution containing a growth-activating vegetable hormone, an emulsin complex and magnesium chloride.¹²

In a variation of the above method¹³ comminuted white oak, preferably bourbon oak, is mixed with an equal amount of comminuted lightly toasted oak and ground powdered acorns. A solution of magnesium chloride is added to the mixture which is placed in a nonmetallic covered container and allowed to germinate for 5 to 10 days at 78-85 deg. C. Additional comminuted toasted oak is added as well as a sufficient amount of magnesium chloride solution. In 10-20 days penicillia of the yellow and green-blue variety are fully developed and the processed wood is ready for use. The acorn kernels employed may be fresh or preserved in 95 per cent alcohol but before use they should be soaked in sterile water. Other woods may also be used for the same purpose.

Charcoal Treatment.—Tolbert and Amerine¹⁴ tested the physical properties and effectiveness of 27 charcoals in adsorbing the important components of brandy from 50 per cent alcoholic solution of each major component of brandy. The charcoals at a dosage rate of 0.5 gram per 100 ml. remove furfural, acids, and tannin; but the esters, acetaldehyde, and higher alcohols apparently are unaffected. Many of these charcoals also adsorb copper, iron, coloring matter or extract material. However, they vary markedly in adsorption ability. Up to about 25 per cent of fusel oil can be removed by using larger dosages of charcoal of the order of 3 or 4 grams per 100 ml., but at 94 per cent alcohol and 70 deg. C., the adsorption of higher alcohols is reduced. Increasing the period of contact does not improve adsorption. The tests indicate that before commercially using charcoal for brandy, the distiller should test a number of carbons. In general, charcoals fail to remove from the brandy an appreciable amount of the major chemical components but they improve the organoleptic character by removing obnoxious odors, taste, and color—a conclusion reached previously by Hassler.¹⁵

The papers of these series contain abstracts of the literature principally concerned with the rapid aging of whiskey. A review of the literature discloses that there is equal interest in the rapid aging of wine and other alcoholic beverages.

¹ G. Toth, *Magyar Chem. Folyóirat* 38, 129 (1932).

² Z. de Sándor, *Mezőgazdasági Kutatások* 4, 468 (1931).

³ Verein der Spiritus Fabrikanten, German Patent 291,349 (1915).

⁴ J. E. Carroll, U. S. Patent 968,832 (1910).

⁵ H. C. Merriam, U. S. Patent 2,096,334 (1937).

⁶ E. H. Herrick, U. S. Patent 2,086,080 (1937).

⁷ E. E. Cox, U. S. Patent 2,036,167 (1936).

⁸ J. H. Phillipsky, German Patent 549,524 (1929).

⁹ A. Jareand and J. Roussel, British Patent 148,829 (1920).

¹⁰ J. M. Fain and F. D. Snell, *Ind. Eng. Chem., News Ed.* 12, 120 (1934).

¹¹ C. S. Miller, U. S. Patent 1,981,873 (1934).

¹² Ernst T. Krebs and Ernst T. Krebs, Jr., U. S. Patents 2,070,794 (1937); 2,119,234 (1938); 2,224,352 (1940).

¹³ Ernst T. Krebs, U. S. Patent 2,347,783 (1944).

¹⁴ N. E. Tolbert and M. A. Amerine, *Ind. Eng. Chem.* 35, 1078-82 (1943).

¹⁵ J. W. Hassler, *Active Carbon*. Gilhens-Sohl Corp., New York, 1941.



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SOAPS

Notes for the Soap Industry

PAUL I. SMITH

INCREASED attention is now being given to the polyhydric alcohol esters, many of them highly complex chemical entities and, in fact, mixture of the mono fatty esters, the di-fatty esters, and, in the case of the glyceryl compounds, small percentages of the tri-esters with perhaps a percentage of free acid.

BASES FOR DRY CLEANING SOAPS

Among the interesting applications now being found for the polyhydric alcohol esters are as bases for dry cleaning soaps. Diethylene glycol laurate is of particular interest in this respect. It dissolves quickly and clearly in all dry cleaning solvents, possesses high detergent value, acts as a solvent for grease and helps emulsify and remove water soluble dirt. According to dry cleaners it does not build up pressure on the filters during recovery of the "spent" dry cleaning solvent. Another interesting new base for dry cleaning fluids is glycerol mono laurate which possesses properties similar to diethylene glycol laurate.

Urea, a white, readily soluble, odorless and harmless chemical is now being used as an additive in washing compositions to increase detergency and give body. It is also claimed that the addition of urea tends to reduce the harshness and undesirable action of certain detergents on the skin. A recent American patent, 2,374,187 covers the production of detergent compositions particularly suitable for persons allergic to soap. One of the compositions named in the patent contains 95 per cent urea and 5 per cent sodium dodecyl sulfoacetate. Other additives designed to improve the detergent efficiency of synthetics, particularly the anionic compounds, such as the sodium alkyl sulphates, include acid triphosphates with 3 to 5 hydrogen atoms, and new types of sodium borate containing 1.1 to 2 molecules of sodium oxide per molecule of boron oxide. From exhaustive trials carried out it has been shown that the addition of 1.5 parts of the borate to one part of anionic detergent greatly improves washing power with-

out increasing the pH. The use of acid triphosphates as builders is covered by U. S. patent 2,383,502.

RED OIL FOR SPECIALIZED PRODUCTION

Double distilled red oil is now in great demand for specialized productions. The finest grade of this oil contains 2-3 per cent unsaponifiables, has a titre value of 10-12 and iodine number, 90. Apart from being used as a very high grade soap stock, oleic acid is used in the manufacture of pharmaceuticals and polishing compounds. Some of its metallic, non-soluble salts find important industrial uses, e.g., lead oleate in ointments, copper oleate in pharmaceuticals, aluminium oleate as an oil thickener, magnesium oleate as a fire preventative by dry cleaners, calcium oleate as an impregnating and waterproofing material for unglazed porcelain, concrete, fabric, etc. Apart from double distilled red oil, the finest of all technical grades, there are the normal grades which are of a slightly darker color and lower iodine value and with unsaponifiables slightly higher.

APPLICATION OF "PER" CHEMICALS IN SOAP MAKING

The so-called "per" chemicals find several important applications in soap manufacture. Hydrogen peroxide is probably the best known of the peroxides used for bleaching oils, fats and soaps. Ammonium and potassium persulphates are valuable for bleaching purposes and so also is sodium perpyrophosphate. The last named chemical is specially useful for refining commercial soaps. Sodium perborate is finding its way into many washing compounds required to exercise a bleaching effect on cotton goods. This sodium salt is a white, crystalline powder, available as a tetrahydrate and also anhydrous grade, the former containing a minimum of 10 per cent active oxygen and the dehydrated product about 15 per cent sodium perborosilicate is a new washing and cleaning agent recommended for use with a mixture of soap and soda ash. According to U. S. Patent 2,367,971, this chemical is made by mix-

ing 38 deg. Be. caustic soda 6 parts, 36 deg. Be. sodium silicate 22 and borax 23 parts by weight. This mixture is then added to 36 deg. Be. sodium silicate 22 parts and 30 per cent hydrogen peroxide 22 parts by weight. The combined mixture is stirred vigorously until it becomes gelatinous when it is finally dried at 70-80 deg. C. and then finely ground for mixture with the other detergents.

ALUMINUM CHLORIDE SOLUTION AVAILABLE

Aluminum chloride solution is now available for soapers and manufacturers of specialty toilet goods. In soap manufacture, aluminum chloride is required for glycerine recovery and in cosmetics it is highly prized as an astringent in preparation of deodorants. Today high grade aluminum chloride in solution form is specially suitable for these applications. It possesses excellent clarity and is particularly low in iron content. The commercial grade of aluminum chloride solution is of 32 deg. Baume strength, containing not less than 50.3 per cent $\text{AlCl}_3 \cdot 6 \text{H}_2\text{O}$.

John Richard Curzon Dies

Stricken with a heart attack in his office, John Richard Curzon, 55, vice-president and general manager of the Harris Soap Division of the Hygrade Food Products Corp., Buffalo, N. Y., died soon after. A research chemist, Mr. Curzon came to Buffalo in 1920 from his native England and had been with Harris for 20 years. He was a member of the American Chemical Society. He is survived by his widow, two daughters, his mother, a brother and a sister.

Potash Soap Association Committees

The Potash Soap Assn., which recently moved to 723 Fifteenth St., N.W., Washington 5, D. C., has announced the formation of a Technical Committee, with Bernard R. Freudenthal as chairman. A new Publicity and Promotion Committee, with Dudley J. Bachrach as chairman has been formed, and a Statistical and Management Committee with Melvin Fuld, chairman, has been announced.

Dallas Soap Factory Expands

The Procter & Gamble Co. celebrated 25 years of progress in Dallas with an anniversary luncheon, Wednesday, Feb. 26, at the plant at 1226 Loomis St.

Plant superintendent, P. Fulkerson, presided at the luncheon. Guests included Mayor Woodall Rodgers, County Judge Al Templeton, D. A. Huley, president of the Dallas Chamber of Commerce, J. Ben Critz, the Chamber's vice-president and general manager, and representatives of the Dallas newspapers.

Beginning production 25 years ago, the Dallas factory has steadily expanded. A soap manufacturing unit was added in 1941. In the past year an additional unit was completed which almost doubled the capacity of the soap factory. At present, eleven retail products are produced.

One of the most modern in the country, the plant is called an "outside factory" because most of the processing is mounted on a large steel framework instead of under a roof.



Guests and hosts talk it over during a "thank you" buffet breakfast given at the Hotel Biltmore, New York, N. Y., by the Association of American Soap and Glycerine Producers for the Association of Women Directors. More than 150 officers and delegates attended the breakfast which was given March 9.

Seated left to right above are: Miss Elizabeth Hart, Mrs. Dorothy Lewis, Miss Jane Dalton, Miss Mildred Bailey, Mrs. Norma Richards and Mrs. Mary-Madeleine Riddle. Standing are Miss Joyce Cotter, Mrs. Alma Kitchell, Allen P. Ames and Miss Ruth Goldberg.

According to Roscoe C. Edlund, manager of the Soap Association, the patriotic support women broadcasters gave to the fat salvage and soap conservation programs, during the war and after, has been a large factor in the success of these campaigns. The fat salvage campaign is still active because fats are just as short as ever.

Colgate's Net Income Up

Colgate-Palmolive-Peet Co., Jersey City, N. J., has reported a net income for 1946 of \$14,443,835 after providing a deduction of \$3,500,000 for possible future inventory price decline. The net income amounts to \$7.14 per common share as compared with \$3.34 per common share in 1945.

South India Soap Makers Assn.

The South India Soap Makers Association has announced a list of the names of its members. They are: Victory Chemical and Pharmaceutical Works, Ltd., Chalakudi; Vegetable Soap Works, Calicut; Techno Chemical Industries, Ltd., Calicut; Kalpaka Oil Mills, Ltd., Cochin; Arian Soap Manufacturing Co., Coimbatore; Imperial Soap Factory, Quilon; Islamia Soap Works, Alleppey; A. S. Kamath & Co., Mangalore; The Jin Light Soap Co., Chitaldroog; The Parco Soaps and Cosmetics, Coimbatore; Tirur Oil Mills, Tirur; The Raja Soap Factory, Mysore; The West India Soap and Industrials Co., Mangalore; The Pushpakamala Soap Works, Coimbatore; K. H. Soap Works, Bangalore Cantt.; Kannappiran Soap Works, Pudukkottai; P. B. Mohan Brothers, Madras; Ganga Works, Adyar, Madras; The Hyderabad Soap and Oil Works, Ltd., Secunderabad; The Mattur Chemical and Industrial Corp., Ltd., Mettur Dam. R.S.; and Josco Chemicals, Ltd., Ernakulam.

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WASHINGTON PANORAMA

by ARNOLD KRUCKMAN

THE enterprise to "contain" the Russians within certain European and Asiatic bounds is far greater in its implications than the country has so far been permitted to know. In Congress they tell you the \$400,000,000 to be spent upon military and industrial objectives in Greece and Turkey is simply peanut money. They expect it will cost us billions before we come to the very uncertain end of the adventure.

RESOURCES TO GO INTO KOREA

The country has already been told the next step will be to pour our resources into Korea. The situation there is so critical, apparently, that some military people are sending their families home. China is to be the goal after Korea. The other day we made a treaty with the Philippine Republic, by the terms of which we are building installations in approximately 20 areas of the Islands. These are submarine bases, naval bases, airplane bases, harbors, docks, and many other military works. We have been told here that we will build a big naval base at Singapore; possibly, still other installations at other points on the coast line of Asia.

It is generally understood we will help Italy, Syria, Arabia, Palestine, Iran, Egypt; that we will make the effort to dominate the Mediterranean, which may mean further enterprises in North Africa. The program involves not only military aid, but rehabilitation of the industrial activities of each region—which would naturally include the production of essential oils in the consistent areas. This means, in some instances, the activation of industries which produce goods in competition with ours; in all these places the standards of living are low, and wages lower.

The Congress is bothered about the effect of the dumping of products from low standard countries into the United States: What effect this development will have on our wage scales and living standards. And what the taxpayers may say—and do—when they discover their money is being used in enterprises that reduce their opportunities and their standards.

WAR ECONOMY IS IN VIEW

The Congress is also worried about the eventual effect upon our own supply of materials. Lead, zinc and tin already have almost vanished. Copper is scant. Iron is begin-

ning to be a problem. Fuels are not illimitable. We are told here this new undertaking will take U. S. goods abroad which we need at home. Industrial replenishment, and consumer supplies for our own needs, inevitably will be delayed. Machinery and materials we need here for our own capital plant and equipment will go to foreign countries. All this spells an industrial speed-up; and, again, will undoubtedly spur people who are balked in one direction, to patronize the "luxury" markets heavily. Congress knows we are rapidly moving into another war economy. The armed services naturally will buy enormous quantities of many products and materials, for use abroad as well as for preparations at home. This means new U. S. industrial mobilization. Britain has resumed virtually all its war controls. The thought is here that we must put into operation quickly many controls to make certain we can fill the pipe-lines anew with goods that go abroad.

It is expected as soon as the Congress agrees to the Greek-Turkey program, (which undoubtedly will happen promptly), the Government will be obliged to make allocations of goods and services, between our country and those whom we are trying to support abroad. Among the earlier control measures are expected to be those which regulate prices, marketing, storage, and transportation. Like Britain we are headed towards restoration of wartime controls, even if the terminology and the methods of imposing the controls, may be different from our recent war controls.

There is little doubt business men will, within 3 or 4 months, again be turning to Washington for priorities, for allocations, for permits; and it seems logical to expect business men again will be needed in Washington to administer the business problems of the "containment" program. Patently, all this must again require work forces in Government. There is every reason to feel that most of the million Government employees, who are now being discharged, must find their way back into Government jobs again and with all this potential expense ahead, it does not take much imagination to see that taxes will not decrease, and that budgets will expand.

Congress sincerely will try to make clear that this "containment" enterprise is not designed for war, but is an expenditure to insure against war. The theory is that no one, including the Russians, will deliberately provoke a war, at this time.



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Recent reports from the American Consul at Shanghai indicate that peppermint oil, menthol, and dementholized peppermint oil, traditional and historic products of China, are not doing well. Inflation of prices, unfavorable rate of exchange, scarce stocks, and foreign competition, are responsible for the difficulties of the Chinese growers and processors. Peppermint is grown in all parts of China, but comes in largest volume from the North. Normally, 85 per cent of the products are sold abroad, with the United States the largest customer. During the war there was a great market for the product because it is highly inflammable and was used as an ingredient in incendiary bombs.

In pre-war days China annually shipped 1,000,000 pounds menthol crystals; last year it shipped less than 80,000 pounds. Export of peppermint oil, last year, was under 50,000 pounds. F.O.B. Shanghai price for menthol crystals last year was \$7.50 per pound, compared to a pre-war average of \$2.00. Dementholized peppermint oil sold at \$2.75 per pound last year, in contrast to an average of 70¢ per pound before the war. The 20 factories operating at Shanghai before the war have dwindled to 6, and the annual production of oil has been reduced four-fifths. The American Consul reports stocks now on hand in Shanghai are about equal to the supply available for export last year. He also states the products have been found, by testing laboratories, usually to be free of adulterants.

Office of International Trade, Department of Commerce, announced recently the United Kingdom has resumed operation under the British Token Import Plan, which permits limited quantities of specified commodities to be imported into the British isles. Perfumes and cosmetics from the United States were listed in the specified category. The shipments are limited to 20 per cent of the average annual shipments during 1936-37-38. Under the new plan the application form must show facts based upon the exporters' actual records, "or other documentary evidence." OIT certifies the approved applications and issues scrip to cover the amount of the shipment. The exporter must send this to the British importer, who must use the scrip to obtain an import permit. Applications must be filed on or before April 30, in order to be considered as claims for full individual quotas. Forms may be obtained from the Commerce Department Field Offices anywhere; or from the British Token Import Plan Unit, Department of Commerce, Washington, D. C.

SUGAR SUPPLIES TO BE INCREASED

Department of Agriculture reported that the world supplies of sugar are expected to be 10 per cent larger this year than they were last year. Production this year is estimated at 30,000,000 short tons, compared to 26,700,000 tons last year. Next year it is predicted the allocation in the United States will be 90 per cent of the prewar per capita supplies. Price of export sugar is rising. Incidentally, the U. S. Government has agreed to pay \$4.92 per hundred weight for the estimated 5,800,000 tons expected this year from Cuba. It is anticipated sugar controls will pass entirely under the supervision of the Department of Agriculture when the OPA rationing ends in April.

Department of Agriculture recently announced manufacturers may expect greater supplies of soap fats, especially during the current half year, ending June 30. The

promise was made that the 970,000,000 pounds last year for the same period would increase between 10 per cent and 12 per cent. The greatest increase is expected during April, May and June. Import of lauric acid oils will substantially increase. Prices will continue high, in the judgment of the Agriculture pundits. The Andresen Committee of the House of Representatives has been making an enquiry into shortages of industrial and household fats and oils.

Lead continues scarce. Some experts say it is gradually disappearing from our domestic production. The same is reported of zinc. Bureau of Mines investigations in Arizona proved futile. Some medium grade lead-zinc deposits were reported in Shoshone County, Idaho. Old tin cans decreased to such an extent that detinning dropped 21 per cent in 1946, reports from the Bureau of Mines made clear. Commercial closures decreased by 10 per cent in production during January. All size restrictions were removed in March on tin plate andterne plate cans, by OTC. The agency warned that it is doubtful tentative tin allocations will be available. Government warned that steel containers would be short in supply until July or August.

The Citrus Corporation of America has filed with the Federal Trade Commission to export citrus products and by-products, under the Webb-Pomerene Law. Its headquarters are located at 424 Madison Avenue, New York, N. Y. The 1946-47 citrus fruit crop is estimated at 204,520,000 boxes.

RFC announced it would sell, through the U. S. Commercial Co., 100 drums Japanese camphor oil, due to arrive in New York in April. It also will offer camphor tablets and camphor powder and vegetable wax. War Assets Administration announced it would sell essential oils and fixed oils valued at \$120,000. The products were stored in Binghamton, N. Y.; Cincinnati; Louisville; Richmond; Savannah, and St. Louis.

PUERTO RICAN VANILLA GROWING

The Federal Experiment Station in Puerto Rico has successfully blazed trail in growing vanilla. After its experimental work, a vanilla cooperative was formed, consisting of small farmers. Over 6000 pounds of cured beans were sold during 1946. The Station also has successfully produced spices and plants for the distillation of essential oils. A new and interesting flower absolute was developed from flowers of the coffee plant. New varieties of ginger have been introduced which are in commercial production. In Texas, experiments with mesquite have produced a mesquite gum which is a satisfactory substitute for gum arabic, gum tragacanth, Indian gum and Ghatti gum. It is the inorganic salt of an organic acid consisting of four molecules of arabinose, three molecules of galactose, and one of methoxyglucuronic acid united with the loss of seven molecules of water.

The Federal Trade Commission will hold a trade practice conference for the cosmetic industry, under the supervision of Commissioner Robert E. Freer, in New York, N. Y., beginning May 12 and extending through May 13. The purpose is to establish fair competitive conditions in the industry and to formulate rules for the protection of the purchasing public against unfair or deceptive methods or practices.

The Senate-House Committees agreed to continue excise taxes on perfumes and toiletries as presently established.



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The American Perfumer

NEW PRODUCTS AND PROCESSES

Odor Classification Set

The Crocker-Henderson Odor Standards have been incorporated in an Odor Classification Set, and this is being manufactured by Cargille Scientific, Inc.

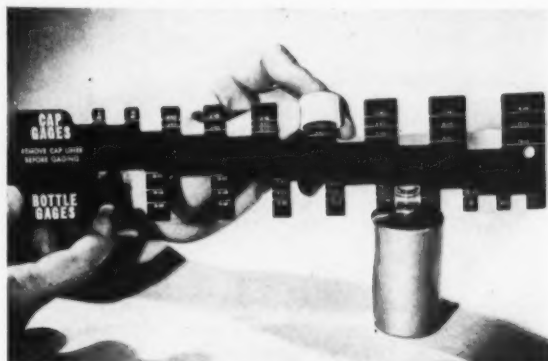
Crocker and Henderson made a fundamental contribution to the science of odors when they developed the system of classifying odors according to the intensity of four odor "components" which they have termed Fragrant, Acid, Burnt and Caprylic (goat-like). Variations of intensities of these four components makes it possible to assign a specific number to any odor.

In this odor classification set, thirty-two standards, with extra empty vials, are furnished in a convenient wooden block. The cover is of transparent plastic. It is stated that with a little experience only a few minutes are required to evaluate an odor.

Thioglycolic Acid Price Reduction

Evans Chemetics, Inc., 250 East 43rd St., New York, N. Y., has announced a reduction on purified Thiovanic Acid (vacuum distilled thioglycolic acid) to \$1.95 per lb. on the 100 per cent basis. A year ago this product sold at the basic price of \$3.50 per pound.

In addition to the purified grade, Evans offers a technical grade, not of such high purity, at \$1.40 per lb.



How the gage works



Crocker-Henderson Odor Classification Set

Cosmetic Grade Lanolin

A new type of odorless lanolin has been introduced by N. I. Malmstrom & Co., in a non-darkening pale color, which, it is stated, will not affect the color of creams, ointments and lotions. Its makers claim that it will not turn rancid and is highly resistant to heat and sun.

New Bottle and Closure Gage

A new cap and bottle gage likely to be of interest to any user of bottles and closures has been designed, and is now offered by Stanley Sapery. Since the difference between sizes is so slight people are constantly making costly errors on the various cap sizes and neck sizes of the bottles. By the use of this gage it is pointed out they may very quickly find the right size, Glass Container Association finish, of both cap and bottle. A patent has been applied for on the

new gage which is made of a laminated cloth base phenolic plastic.

To find the size of a cap it is merely necessary to select the projection over which the cap fits most snugly. To find the size of a bottle the cut-out into which the bottle neck fits

most snugly is selected. The gages may be obtained in volume with the distributor's name imprinted inexpensively for distribution as an advertising item to be either sold or given away. Full details about the new gage will be furnished on application.

New Catalogs

"Cellosolve" and "Carbitol" Solvents," a new booklet published by Carbide and Carbon Chemicals Corp., a division of Union Carbide and Carbon Corp., 30 East 42nd St., New York, N. Y., presents in detail the important properties, specifications, uses, and constant boiling mixtures of nine glycerol-ethers. In chart form, it gives information on physical constants, comparative evaporation rates, and various solubilities. Copies of the booklet, Form 4765, may be obtained from the nearest office of the Corporation.

The latest copy of Lab-Scents is now available through Aromatic Products, Inc., 15 East 30th St., New York, N. Y.

A 40-page, three-color, plastic-bound catalog, "Improved Pyrin No. 20," has been issued by John Powell & Co., Inc., 1 Park Ave., New York, N. Y., and is available upon request.

Profusely illustrated with photographs reproductions, charts, graphs and tables, the new catalog describes in detail the Powco Brand Product, Improved Pyrin No. 20, which is a pyrethrum base insecticide concentrate designed for use in the manufacture of household sprays, stock sprays and industrial-type insecticides.

Included for the first time is a description and structural formula for Sesamin, the synergist in Improved Pyrin No. 20, which, it is stated, increases the killing power of the pyrethrins 200 to 300 per cent.



#A-4289 is a cosmetic bottle—ideal for leg make-up... the *Empress* closure is the choice whenever the good looks of a package are important.

PERFECTLY MADE-UP...

Your product in the exactly right Duraglas Container!

A sparkling, attractively made-up package catches the customer's eye—wins your beauty product a place on her dressing table.

Our stock drug, chemical and toiletry line includes more than 1400 Duraglas containers! Each is a dependable protector, an efficient, economical package, a flattering background for your distinguishing label!

Among these functional containers you should find one that's made-to-order for your product's special requirements—the right shape, the right size, *the right look!*

After you've selected the container that fills your needs, choose an O-I closure that will be the finishing touch to a package that protects, beautifies—and *sells!*

Duraglas

TRADE MARK REG. U. S. PAT. OFF.

CONTAINERS—Protectors of Quality

OWENS-ILLINOIS GLASS COMPANY, TOLEDO 1, OHIO Branches in Principal Cities



A compendium of significant news and views

Harold Hutchins says . . .

WHY NOT YOU?

Does anybody reading this know about the new centrifuge method of casting? It's a honey, and if, when and as, the apparatus is enlarged to accommodate really big industrial pieces, we will see a revolution in machinery-making and repairing! Seems as if a dentist fellow translated the method of the lost wax of the great Cellini into its modern counterpart and went into jewelry. And the end is not in sight. A smart designer of cosmetic metal items will make the first step.

TAR BARREL MYSTERIES

Some manufacturers still are riding the horse of the natural versus the so-called synthetic products. Certainly, the name and fame of PERKIN should be recalled. He dived into the mysteries of the tar barrel and brought forth mauve and, later, the odor we know as coumarin. Why the distinction then between the product of the vegetable and animal kingdoms, as natural versus mineral?

PLEASE CHECK!

Cationic surface tension-acting agencies are on the move. They are antiparasitical (maybe) and antibacterial (certainly) and perhaps the antibiotics belong to the group. Wakeman is convinced one of his agencies is very much like a cationic surface tension material. Surely, the name of quarternary ammonium compounds is being found more and more in the literature.

PAGING UNCLE SAM

The hospital plan business we mentioned some issues back is now being placed in actual operation. Uncle Sam sends dollars to local units for

planning and building hospitals. I always wonder when Uncle Sam will send dollars to build and distribute pharmaceuticals and then cosmetics? Ah yes, it reminds me that U. S. dollars built the first or pilot penicillin plants and U. S. supervised the distribution of the stuff, too.

MURRAY BAY BOUND

The Toilet Goods Manufacturers' Association of Canada will hold its Annual Convention at Murray Bay in June. At their meeting last month, P. L. Baker used lantern slides to illustrate his message, "Transportation of Tomorrow."

WHO CAN EXPLAIN IT?

Why do the passengers photographed arriving from abroad, and labelled refugees from this or that country, look so well fed? Something must be wrong, somewhere!

MALIGNED?

Did you read that "profile" of the little Health Commissioner of the great big city in a recent issue of the *New York Herald-Tribune*? We like the little Commissioner and, knowing him personally, wonder if he was maligned? Not a word about his real heroic deeds in two World Wars! He was right in the front line each time. This second war found him close to fifty and too darn close to danger for plenty of younger men. Not a few others, holding reserve commissions, "ratted" out of active duty. His latest battle of giving New York City cleaner eating places is terrific. It should not be permitted to be lost, as so many others have been lost in the past. Damning, by faint praise, will not help the effort for clean restaurants, barber shops and beauty parlors.

IT'S STILL IRON

It looks from here as if old-fashioned or revitalized iron therapy is making a comeback. Lowly iron has seen many rises and falls, since the day some thinking, walking-on-two-feet ancestor of man reasoned that if an iron tip in an arrow killed a lion, then iron must be stronger than the lion. And water that was rust-red with iron must have the powers of the arrow tip. That, at least, is an explanation. Then came science, and it was learned that iron alone was not much good. But, iron and copper worked wonders. Nowadays, we add some fraction of Vitamin B complex-folic acid. But, it is still iron.

BABY COSMETICS

The baby crop of recent years is the vital force behind many advertising campaigns. The number of baby pictures in advertising is on the increase. One afternoon city newspaper recently devoted an entire section of its paper to the subject of babies. We always said there would be baby cosmetics, as well as teenage cosmetics. And once, more or less, we mentioned new-born baby cosmetics. Why not?

IT'S NO JOKE

Listening to a famous radio comic the other night lampooning a "Century of Medical Progress" gave thought to the idea—HOW COME? Here is a profession, second to none in relieving the ill and restoring the halt and the lame, yet millions are given a lopsided and funny view of a century of medical progress. Well, doctors don't seem to care. We bet that not one in a hundred thousand sent a letter of protest to the station, or to the alleged comedian!

Silten



aromatic materials

POLAK & SCHWARZ

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ZAANDAM, PARIS, LONDON, RIO DE JANEIRO, BUENOS AIRES

404 April, 1947

The American Perfumer

MORE GERIATRICS

We said something recently on the age of our population. This is a subject dear to our heart. From a total of 6.6 million in 1930, the number of people 65 and over is increasing and will reach 22 million in 1980. The percentage of aged people will more than treble during this period. In the 1940 census, 7.3 per cent of the people of the U. S. were 65 or older, as compared with 5.4 per cent in 1930, and 4.1 per cent in 1900. We take good care of our old-timers. Yes, that we do!

HOW ABOUT IT?

A recent news dispatch states that the New York City Health Department is out to control the city's smoke, on a health basis. Now, if smoke comes under the Sanitary Code, how about other measures for the prevention of disease and accident and death? In case you haven't noticed, the doors of many apartment houses and hotels should be inspected by the smoke detectives. These doors open in toward the house, rather than away from it, even in the best places. Any panic would pile the people, saved from the hazards of smoking chimneys by the Health Department, against these doors and they would die in the fire or by being trampled. How about it, Mr. Commissioner?

PAY-ROLL SIGNERS?

The New York City Police Department has restored the Honorary Police Surgeon hocus-pocus of former administrations. This same department has or is going to have a public relations man on its staff, which brings to mind the fact that "The Pen Is Mightier Than The Sword." By the way, have you noticed how many city, state and federal governments have taken on public relations men? Also many of the trade associations now have them under their wing in some such capacity as administrative assistants, while others may be editorial staff members, or just plain pay-roll signers.

BEAUTY LOSES OUT

Many medical schools must be cashing in on the money from Uncle Sam for the instruction of former medics seeking advanced study. Just how much of the dough is returned to the students, through improvement in teaching, modernization of laboratories, and materials for use? Or does all too much of this money

go to support the institution in its normal affairs? Any boosts for Assistant Deans in charge of GI activities? Of course, the professors may, or may not, be given a token check—one usually donated to the institution by endorsement as soon as "loaned." Some GI physicians, on hospital staffs, find they are registered as students and the subsistence pay, formerly given by the hospital or teaching institution, has been reduced to one buck a year. Uncle Sam pays the rest. You know, \$65 for a single fellow and \$90 for a married man. By the way, we wonder if there are any good courses for barbers, beauticians and cosmeticians under the GI Bill of Rights? If not, why not? Sorry, we only ask the question!

HIGHER POSTAGE RATES

The U. S. Post Office deficit for the coming fiscal year will be \$287,679,000, and the Department has asked Congress to boost the rate on postal cards to 2-cents; the rate on parcel post up about one-third, and special delivery rates up to 20 to 45 cents. What wallops for heavy customers of Uncle Sam's postal service!

EXPANDING

The Michigan Chemical Corp., makers of "Pestmaster" DDT insecticides and chemicals, has leased a large portion of the Pine Bluff Arsenal at Pine Bluff, Arkansas. The property will be used for the manufacture of industrial and insecticidal chemicals, through a newly-formed subsidiary, the Michemco Corp., Inc.

"GREEDY PROFITEER"

Traditionally, in this country's manufacturing set-up, total wages have been four times total profits. During the war, wages soared to an unprecedented eight times over profits. Today, the differential is still high, with wages six times profits. These statistics show, of course, that if there had been any "money grab" in this country in recent years, it is the worker and not the stockholder who has gotten it. But, to make it all the more ludicrous, the very people who are now shouting "greedy profiteer" at the industrialist and investor in industry, are proposing wage increases which would make wages thirteen times profits, on the basis of current earnings. There is a simple lesson to be learned from these facts. It is that we should not accept at face value the "labels" that some people attempt to put on others. We should rather try to find out why these people are doing the labeling.

SOAPLESS SOAP SEQUENCE

The soapless soap advertisements are growing in number, and the little magazines with the big circulations have one article after another on the new products. Methinks the new soaps are products of the great industry of cosmetics and pharmaceuticals. Certainly, the soapless soaps were known to the industries, and now the advertisers are finally bringing the public into the secrets. And a good thing, too, if not over-done. Incidentally, does anybody know of a good book on the subject—one suitable for copy writers and writers of general magazine articles? Does anybody even have a manuscript on the subject which is ready for publication?

LUCKY YOU!

When you are singing under that shower, be doubly happy that you don't depend upon bubble-bath preparations for a living, because 43 per cent of American homes do not have a private bath or shower, and 31 per cent of all American homes lack running water. As for electricity, 21 per cent lack it!

"ART OF LOVE"

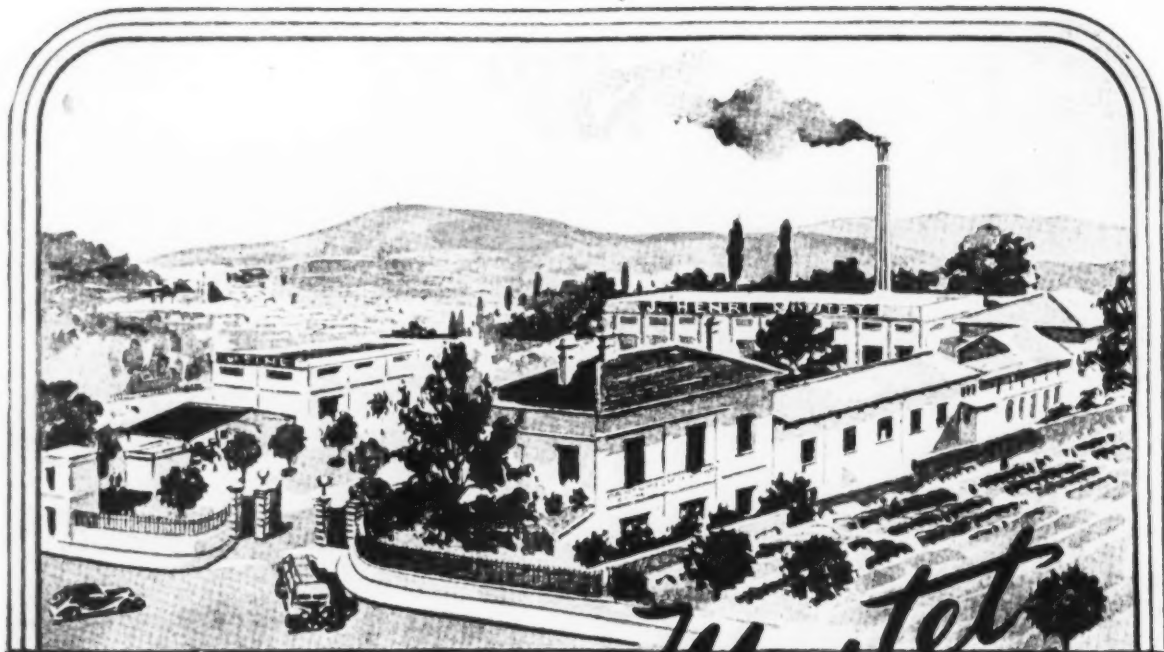
Going back into history, our own "Beauty Hints Department" learned that back in B.C., an old Roman wrote in his book—(Art of Love)—"Comb your hair carefully. If your face is long, part your hair in the middle. If your face is round, comb a knot on top of your head and expose your ears." Well, it's still good 1947 years later.

ALL-TIME SALES HIGH

Park & Tilford, Inc., and subsidiaries, manufacturers and distributors of All-fabric Tintex Tints and Dyes, and Park & Tilford perfumes and cosmetics, attained an all-time high in sales and earnings last year, according to the annual statement recently released by Arthur D. Schulte, president. A new three-month advertising campaign for Park & Tilford perfumes and cosmetics has just been released through Charles M. Storm Co. agency.

BUYS NEW PLANT

In line with the expansion program which has been planned for 1947, Marv Chess, Inc. has purchased a three-story plant in Newark. All production operations have been transferred to the new address, as of April 1st. The building is located at 420 Frelinghuysen Avenue and comprises approximately 50,000 square feet.



J. Henri Moutet

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24

FLOWER OILS · ESSENTIAL OILS & AROMATICS
for the
SOAP · PERFUMERY · COSMETIC & ALLIED TRADES

Laboratories, Distilleries & Head Offices: GRASSE · A. M. FRANCE



LET THEM EAT BOXES!

Natalie Cherry, an executive of the Allen B. Wrisley Co., and a Manhattan visitor last month, readily admitted to this writer that the price of soap is UP again, due to the mounting costs of fats and oils and, of course, paperboard. Boxes to hold soap, she told us, are so costly that they should almost sell for the price of the soap alone. It's too bad, she lamented, that we can't figure out some way of washing with the boxes, too! Her company, she concluded, does not view the present economic conditions with too much alarm, because their products are still in demand by discriminating buyers.

RINGS TWICE

The Robert Gair Co., Inc., mailed its Annual Report for 1946 to stockholders last month. In his review of the year's operation, George E. Dyke, chairman of the board and president of the company, in part said: "For the year ending December 31, 1946, the profit of the company, and its consolidated domestic subsidiary without giving effect to the dividend received from the profit of Gair Co. Canada limited) was \$2,066,022, and the profit of Gair Co. Canada Limited and its Canadian subsidiaries was \$578,342. The combined profit of the company and its domestic and Canadian subsidiaries was \$2,644,364. After payment of \$340,824 in dividends on the Company's preferred stock, the balance of \$2,303,540 was equal to \$1.32 per share on the 1,740,440 shares of Common Stock outstanding."

NEW MOSQUITO ERADICATOR

DPE, which is DDT minus some of its chlorine, will kill mosquito larvae, without harming fish. Fisheries men and conservationists may be relieved of their worry about destruction of fish, as a result of DDT sprays and dusts distributed over inland waters to kill mosquitos, since the new DPE might be used instead.

SOAP PRODUCTION UP

Although the last quarter of 1946 saw soap production increase for the first time in two years, delivery by soap manufacturers during that period (603 million pounds) was still considerably under the prewar average of 1935 through 1939, reports the Association of American Soap and Glycerine Producers. While this delivery was 22 per cent over the 494 million pounds reported in

the quarter ending September 30, sales in that quarter were the lowest in nearly ten years, it was explained. The Association's figures, based on reports from 70 manufacturers, constituting about nine-tenths of all U. S. soap and glycerine producers, showed a delivery of 2,315 million pounds of soap, other than liquid, for the entire year of 1946, which was 19 per cent less than the total 1945 delivery and 29.4 per cent less than that of 1945.

CEREAL CHEMISTRY

At Kansas Wesleyan University (Salina) a course in cereal chemistry is being offered, beginning with the second semester. Such a course, functional to the Middle West, is unique in that it is offered at few other schools.

TOILETRIES SALES UP

The sales volume of toiletries in 1946 totaled \$699,600,000, according to a recent estimate given by S. L. Mayham, executive vice president of The Toilet Goods Association. This includes perfume, cosmetics and other toilet preparations, but excludes toilet soaps. A 6 per cent increase was noted over the 1945 volume.

CASH DIVIDENDS UP

Publicity reported cash dividend payments by U. S. corporations totaled \$4,334,700,000 in 1946, which was 12 per cent more than the \$3,878,200,000 paid out in 1945. For December 1946, payments amounted to \$950,200,000 as compared with \$768,200,000 in December 1945, a gain of 24 per cent. The figures, both for the year and December, include only publicity reported dividend disbursements, which account for about 60 per cent of all cash dividends paid.

PLASTIC RESEARCH

The College of Engineering of the University of Illinois, and the Plastics Division of Monsanto Chemical Co., recently announced renewal for the third year of a contract wherein Monsanto provides funds for a fundamental research program on the dynamic fatigue characteristics of plastics. The research, which is being done under the direction of Professor William N. Findley of the Department of Theoretical and Applied Mechanics, is intended to provide a better knowledge of the behavior of plastic materials under cyclonic stresses, and to aid in choosing the best test methods for use in studying the fatigue properties of these important materials.

YOUR NOSE KNOWS

Advertisements that smell good were predicted by Dr. Ralph Bienfang, Professor of Pharmacy at the University of Oklahoma. He believes that odor will be added to color in advertising, in order to attract customers.

SNIFFLE STOPPERS

New methods of air purification are being tested to reduce air-borne respiratory infections, the major cause of absenteeism in industry.

LABOR AGREEMENT

Lever Brothers Co. and the International Chemical Workers Union (AFL) recently signed an agreement that provides a 15¢ per hour wage increase and winter vacations. The union is reported to have hailed it as "one of the best examples of good collective bargaining in the United States."

PACIFIC COAST DEBUT

The Pacific Coast Section of the American Pharmaceutical Manufacturers' Association participated for the first time in the annual sectional conferences, meeting last month at the Biltmore Hotel in Los Angeles. Officers of the new APHMA section, which was founded last July, are Chairman F. L. Henning of the Nion Corp., Vice-Chairman LeLande Quick of the E. S. Miller Laboratories, and Secretary-Treasurer Harlow B. Boyle of Boyle & Co.

BUY BIG ONES

According to a recent survey made by the *American Home Reader-Consumer Panel*, 75 per cent of its members purchase large size dentifrices; 22 per cent buy the medium size; 2 per cent buy the small size, and 2 per cent buy other sizes.

DCAT DINNER

Well over 2200 leaders in the drug, chemical, cosmetic and related fields from all parts of the country assembled in the Grand Ballroom of the Waldorf-Astoria last month to attend the 21st Annual Dinner of the Drug, Chemical and Allied Trades Section of the New York Board of Trade. Dr. Carle M. Bigelow, chairman of the Section, presided. Fred J. Stock, vice chairman, paid tribute to the late Jessie L. Hopkins who, at the time of his death on July 13, 1946, was the oldest member of the Section. United States Senator Owen Brewster from Maine was the principal speaker, addressing the gathering on the subject of our foreign relations.

3 Distinguished Names In The Perfume and Flavoring Industry

DR. ALEXANDER KATZ & CO.

*Perfume and Flavoring
Raw Materials of Quality*

MADE IN CALIFORNIA

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PAMIR TIBET
Supreme Perfume Base

F. RITTER & CO.
Established 1876

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RITTER GARDENIA SUPREME
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ESSENTIAL AROMATICS CORP.

•
ESSENTIAL ALDEHYDES
For Perfumes and Flavorings
Octyl-Decyl-Lauric

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CHICAGO • DALLAS • SAN FRANCISCO • SEATTLE • NEW ORLEANS

INDUSTRIAL QUALITY CONTROL

Adrian College (Adrian, Mich.) is offering a course in Industrial Quality Control this semester. The class meets Monday evenings, with Professor Howard W. Alexander, professor of mathematics and physics as instructor. Approximately half the time of each class session will be devoted to a laboratory period in which the student will construct charts from actual industrial data, from the measurement of simple objects, and from normal distributions.

"POWDERED AIR"

A powdery silica so fine that a cubic inch contains a half trillion (500,000,000,000) particles has been produced as an improved gloss reducing agent for lacquers and varnishes, reports Monsanto Chemical Co. The product, which has been described as "Powdered Air," is known as Santocel. It imparts a desirable sheen to furniture, rather than a high gloss, and brings an improvement in mar and burnishing resistance.

ANNOUNCEMENT!

Future U. S. Department of Commerce "Industry Reports," on Chemicals and Drugs, will be distributed through the Superintendent of Documents on a subscription basis. For the past several years, these reports have been distributed gratis. Price of "Chemicals and Drugs," issued monthly, will be \$2.50 domestic, and \$3.50 for foreign subscriptions. The report on "Fats and Oils," published bi-monthly, will be \$1.00 domestic, and \$1.35 foreign.

HONORED FOR RESEARCH

Dr. Charles A. Thomas, vice president and technical director of Monsanto Chemical Co., and one of the key figures in the development of atomic energy, has been awarded the 1947 Industrial Research Institute Medal, presented for outstanding contributions to the field of industrial research.

IT CAN HAPPEN AGAIN!

Industrial peace in our country today hinges on the courage and statesmanship of Congress in banning, as contrary to the public interest, both the closed shop and industrywide bargaining. This is NOT to minimize other aspects of the labor legislation now being considered by committees of Congress, as this is being written. But the facts of recent history cannot be ignored, if the

American people are to be protected from a repetition of the near catastrophes of 1946. With the monopoly power given to John L. Lewis, through compulsory union membership and industrywide bargaining, he paralyzed the Nation last May and forced a rise in the price of coal. This can happen again, as long as the monopoly power of unions and their leaders is protected by law.

BRAND NAMES FOUNDATION

Intensified teamwork to foster public understanding of the benefits of advertising and the brand-names system of product identification was launched this month, when leaders of industry, advertising, media and retailing met at the Waldorf-Astoria, in conjunction with the annual meeting of the Brand Names Foundation. Edward S. Rogers, chairman of the board of Sterling Drug, Inc., gave the principal address, speaking on the subject of "What Our Brands Mean To America."

\$6,000,000 EXPANSION

Stockholders of American Potash & Chemical Corp. have authorized issuance of preferred stock to finance a \$6,000,000 expansion at the company's plant in Trona, Calif.

WE ADMIT IT

It must be jealousy, but how in H does a fellow whose initials are M. F. do all the things he does? Now, it's a new edition of a book on soap. It's mysterious!

PLASTICS AWARD

The John Wesley Hyatt "Award For Plastics," presented April 23, at ceremonies held in the Hotel Statler, Detroit, drew more entries in 1946 than any previous year. The distinguished judges of the Award, which is sponsored by the Hercules Powder Co., met in New York last month to determine the winner. The Award consists of a gold medal and \$1,000.

A.C.C.L. Meeting

The Western Division of the American Council of Commercial Laboratories will be host to the Council at its semi-annual meeting to be held at the Hotel Ambassador, Los Angeles, on May 26 and 27. One of the important matters to be discussed at the meeting is the more extensive use of commercial testing laboratories by government departments, as it is felt much of this type of testing can be completely handled by commercial laboratories, with subsequent savings to the American tax payer.

CHEMICAL INDUSTRIES EXPOSITION

Announcement of the 21st Exposition of Chemical Industries to former exhibitors brought an almost instantaneous response, and a large portion of them promptly engaged spaces previously occupied. Interest in the Exposition is reported to be running at a high pitch, giving assurance that the four floors of Grand Central Palace will be fully occupied. The Exposition will be held during the first week in December.

I.P.E.A.A. EXPOSITION

The Second Annual Industrial Packaging and Materials Exposition will be held at the Hotel Sherman, Chicago, April 29 to May 1, inclusive. Ralph Budd, president of the Burlington Lines will make the principal address at the Exposition Dinner on April 30th. A "special event" on "Loss and Damage Prevention" is being arranged, with a group of prominent executives participating therein.

NEW AGENCY

Dermetics, Inc., of Rockefeller Center, New York, has placed its cosmetic advertising account with Wortman, Barton & Goold, advertising agency. Currently, Dermetics is launching a far-flung campaign in newspapers, magazines and trade publications. Robert Spohn is the account executive.

ONCE-A-YEAR DEAL

The George W. Luft Co., Inc. on April 1st announced its "Once-A-Year" deal on Tangee Lipsticks and Rouge, along with the new Tangee "Sales-Maker" display case. These special offers for the independent retail drug trade are for sale only through Tangee selected wholesale distributors.

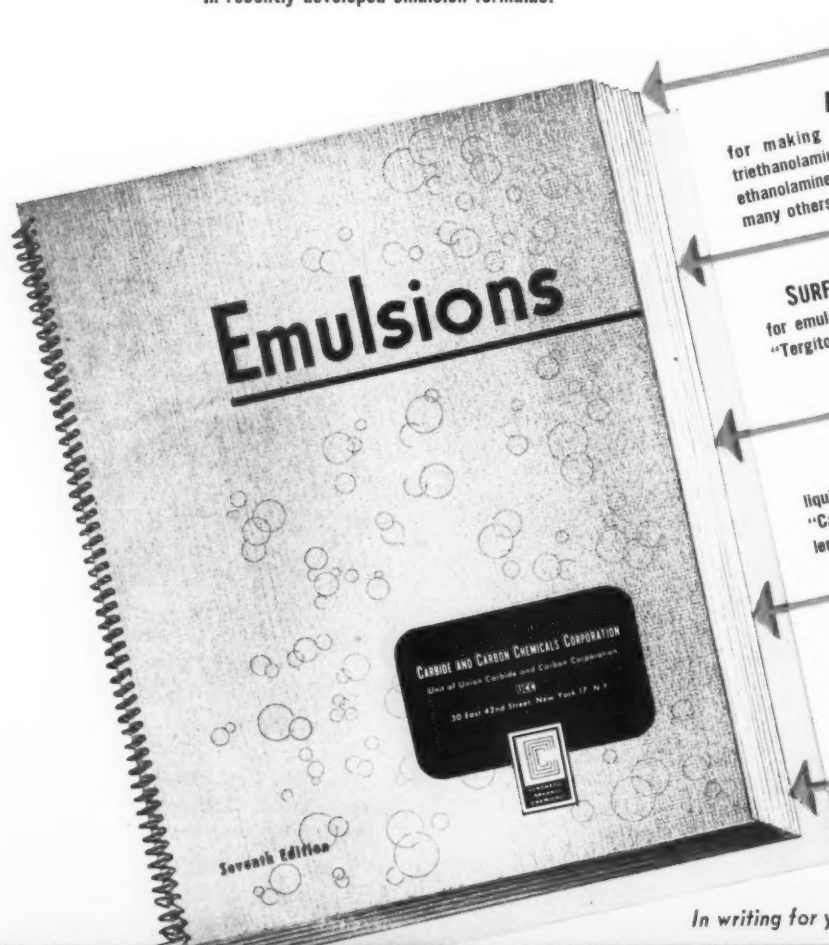
"DUSTLESS" BUILDING OPENED

A new four-story brick and glass windowless, germ and dustproof laboratory plant, designed to be run under constant scientific control, for the preparation of injectible medicines in ampuls was opened by Winthrop Chemical Co., in Rensselaer, N. Y., last month. Most unusual feature is the unique system of dedusting all employees and visitors, as they walk through basement passageways in entering the building. On the upper floors, some 250 different medical preparations are made in quantities numbering in the millions every month for distribution in the United States and to more than 55 different countries throughout the world.

Emulsion Chemicals for

agricultural sprays
cosmetics
floor waxes
shoe polishes
textile oils
leather finishes
water paints
pharmaceuticals
shampoos
cutting oils

The seventh edition of our "Emulsions" book, containing suggested formulas and methods of emulsifying industrial oils, fats, waxes, and greases, has just been printed. This 72-page book includes complete information on the use of our chemical products in recently developed emulsion formulas:



AMINES
for making emulsifying agents:
triethanolamine, morpholine, mono-
ethanolamine, isopropanolamines, and
many others.

SURFACE-ACTIVE AGENTS
for emulsifying chlorinated solvents:
"Tergitol" wetting agents.

EMOLLIENTS
liquid or solid vehicles and ointments:
"Carbitol", propylene glycol, polyethy-
lene glycols, "Carbowax" compounds.

PROTECTIVE COLLOIDS
stabilizing and thickening agents:
"Cellosize" Hydroxyethyl Cellulose WS.

SOLVENTS
all types for coupling agents and
cleaning compounds.

In writing for your copy, please address Dept D1

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

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Distributed in Canada by Carbide and Carbon Chemicals, Limited, Toronto



"Tergitol," "Carbitol," "Cellosize" and "Carbowax" are trade-marks of C. & C. C. C.

SALES TRENDS SURVEY

Results of a new survey being conducted to determine sales and merchandising trends in the drug field will be revealed at the Spring Meeting of the National Wholesale Druggists' Association, to be held at the Palmer House, Chicago, April 21-24. Presentation of the survey will be made by J. O. Peckham, vice president and sales manager of A. C. Nielson Co.

LA CROSS EXPANSION

The increased production in the La Cross organization, brought about by their highly successful launching of "Naylon," has necessitated the following changes and additions to their personnel. Miss Ruby Gould, formerly assistant sales manager, has been named director of retail sales personnel. Miss June Lindow, formerly cosmetic buyer at La Salle & Koch in Toledo, has been appointed general assistant to Vice-President Carl Gardiner, in charge of sales and advertising. Cora Kent, formerly cosmetic buyer at John A. Brown of Oklahoma City, has joined La Cross as a field supervisor of retail store personnel. The following have been

named traveling supervisors — Miss Bea Randel, Miss Marion Reed, Miss Audrey Porter, Miss Kay McDaniels, Miss Cecilia Schreiber and Miss Helen Lewis.

McKESSON & ROBBINS' DIVIDEND

Directors of McKesson & Robbins, Inc., recently declared a quarterly dividend of 60 cents per share on the common stock of the company, payable March 15 to stockholders of record at the close of business March 4th, according to an announcement by William C. Murray, president. A regular quarterly dividend of \$1.00 per share on the company's \$4 cumulative preferred stock was also declared, payable April 15 to stockholders of record at the close of business April 1st.

JEURELLE MOVES

Kenneth A. Bonham, president of Emerson Drug Co., last month announced the removal of administrative and advertising operations of Jeurelle, Inc., manufacturers of Jeurelle and Seventeen Toiletries and Cosmetics, to the company's headquarters in Baltimore, Md. The display room and sales department will remain in the RKO Building in New York City.

P.C.P.&S. FOUNDERS' DAY

The Philadelphia College of Pharmacy and Science recently observed the 126th anniversary of its founding, with an Alumni Mid-Winter Dinner at the College serving as the chief event. Following the dinner, was a basketball game between the Alumni and varsity squads, with the younger men emerging victorious by a score of 52 to 33. Dr. J. W. Sturmer, professor emeritus of industrial chemistry at the college, spoke at a morning Founders' Day assembly.

ADDS COSMETICS

A. George Aboud, proprietor of Aboud's Quality Food Market, 1516 Leopard St., Corpus Christi, Texas, has enlarged his market, with the idea of adding a complete line of cosmetics, along with a frozen food department.

COLOGNE FROM S.A.

Introduction of a new cologne from South America, with each flask containing a real orchid, apparently living and in full bloom, has been announced by R. A. Hillstead, Inc., Miami importing firm, which has exclusive North American rights on the product.

JEAN NIEL, INC.

established in 1824 in Grasse, France

importers of floral essences and essential oils

basic perfume and flavor materials

305 EAST FORTY-SEVENTH STREET

NEW YORK 17, N. Y. PLAZA 3-5974

FOREIGN TRADE CHALLENGE

American ingenuity and resourcefulness are being challenged as never before by problems arising in the rapidly changing foreign trade field, Earl I. McClintock, executive vice-president of Sterling Drug, Inc., recently declared, when addressing the first Foreign Trade Institute at the University of Cincinnati.

PURELY PERSONAL

J. GORDON COLLINS, formerly sales manager of the chemical division of U. S. Rubber Co., has been made vice president and general sales manager of Amecco Chemicals, Inc.

EDWARD P. MORRISH, who has had a wealth of experience in the drug and cosmetic industries, has been appointed executive assistant to Jacqueline Cochran, head of the cosmetic firm bearing her name. He has previously served as director of production for Kathleen Mary Quinlan, Parfums Corday, and for the Affiliated Division of the American Home Products Corp. Prior to that, he was chief of the Cosmetics Division of the Office of Price Administration at Washington. Mr. Morrish's early

work included pharmaceutical research, manufacturing and sales training. Other Jacqueline Cochran appointments include SAUL GROOBER, formerly with Associated Products, and with Lightfoot Schultz Co., as purchasing agent; and the appointment of JOHN W. LAW, formerly with the Hudnut Sales Co., Inc., and the Alfred McKelvy Co., as sales representative for the Eastern territory.

BOYKIN C. WRIGHT of the law firm of Sherman & Sterling & Wright, has been elected a director of United States Industrial Chemicals, Inc.

LOUIS WARE, president of International Minerals & Chemical Corp., has been elected to the board of directors of United States Gypsum Co.

JOHN E. MULHERN, treasurer of Sterling Drug, Inc., flew to England last month to inspect company properties there.

WALTER A. VAHLE has been appointed assistant to the director of purchases and traffic of Monsanto Chemical Co. HARRY F. KLOCKER succeeds him as general traffic manager.

CHARLES T. MENTZER, JR., assistant sales manager of the Fine Chemicals Division of the DuPont Co.'s Organic Chemicals Department, becomes sales manager, succeeding Charles Spencer Rowe, who died last month.

DR. FREDERIC L. MATTHEWS has been named associate director of research of Monsanto Chemical Co.'s Merrimac Division at Everett, Mass.

EARL I. McCLINTOCK, vice president of Sterling Drug, Inc., sailed last month for South Africa to confer with officers of Bayer Pharma Ltd. S.A., a wholly-owned subsidiary.

H. M. WOGISCH has been made purchasing agent for L. Sonneborn Sons, Inc. of New York City, succeeding F. W. Werner, who died recently.

SAUNDERS P. JONES, president of Mary Chess, and his assistant, Mrs. Frances Hollis, sailed last month on the "Queen Elizabeth" for a two-month stay in England and the continent. They will visit the Mary Chess shop and plant in London, as well as spending several weeks in France, Belgium, Czechoslovakia, Switzerland and Italy, "to survey the possibilities of future importations."

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Fine Grade

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NEWS . . . Harold Hutchins Says . . . VIEWS

MIRIAM GIBSON FRENCH, beauty editor of *Charm*, will serve as one of three New York fashion authorities to judge the best-dressed woman at the Columbus Fashion Group Easter Brunch.

LADISLAS MEDGYES, art director of Helena Rubinstein, served as a guest lecturer last month at the City College of New York's Adult Program classes, speaking on "Modern Creative Merchandising."

THOMAS M. KELLY, formerly with Chen Yu in New York, Connecticut and Rhode Island, has joined the sales department of Evans Chemetics.

BERTRAM REIBEL, formerly director of Product Development with Associated Products, has been appointed merchandising manager of Revlon Products Corp.

NORTHROP F. (NORM) BOWES, formerly field merchandising manager of Owens-Illinois Glass Co., has been made Eastern sales promotion manager of the Glass Container Division. Another promotion, announced at the same time by SMITH L.

RAIRDON, vice president and general sales manager, is NEWELL A. (NEWT) PONTET, as manager of the film and display division.

DR. F. BERGMAN, of the Daniel Sleff Research Institute, Rehovoth, Jerusalem, lectured on "The Relationship Between Structure And Carcinogenic Activity of Polycyclic Compounds," before the American Society of European Chemists and Pharmacists.

CARL P. PRATT, formerly with Harriet Hubbard Ayer, and with Primrose House since returning from the service, becomes manager of the retail division of Dermetics.

VIRGINIA GATES MARSH, formerly with Davidson-Paxon Co., Mary Dunhill, Lennen & Mitchell, Saks Fifth Ave., and Lehn & Fink, is named advertising and sales promotion director of The House of Gourielli.

CLAUDE T. GLENN, of the Glenn-Price Tobacco Warehouses of Winston-Salem, N. C., has been elected president and general manager of Wright & Glenn Co., manufacturers of Miss Twinkle, cosmetics for little girls.

RALPH HENDERSON, vice president of Frederick Stearns & Co., Division of Sterling Drug, flew from San Francisco last month to visit the Stearns branches in Australia and New Zealand. He returned to the United States April 7th.

JOHN KUPPER has been made sales manager of the Henry Rosenfeld Cosmetic Co. of New York.

GENE MULLICA has been appointed West Coast Branch Manager of Consolidated Cosmetics and Dana Perfumes.

DOUGLAS D. LANGRILL, well known in the beauty shop field, has been named sales manager of the beauty shop distribution phase of Dermetics.

HELEN NEUSHAEFER, president of Sartorius, has added a new, large size of oily polish remover to her Plasteen-containing line of nail polishes.

ALBERT M. BEHRENS, formerly with Elizabeth Arden, now is advertising manager of Lenthéric.

WILLIAM F. HUNNEFIELD, formerly of Lever Brothers, has been made vice president and secretary of Jean Naté.

OIL ORRIS ROOT LIQUID ABSOLUTE

ORRIS CONCRETE

ORRIS OLEORESIN (*Resinoid*)

Experience demonstrates that none of the substitutes for Orris are wholly satisfactory in giving the characteristic Orris note. It is therefore fortunate that these well known Bush specialties are now readily available.

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LINDEN, N. J.

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The Product of a good Craftsman needs no recommendation.

He who knows how to produce BEAUTY will have people seeking his door. The Diaphanous thing of moonshine we call PERFUME has the Power to stir the Soul. The Caravans that trailed into Damascus and Samarcand live in song and story, not because they carried woolen threads woven together — but because they brought BEAUTY.

The Nucleus and Essence of that quality of Perfection is found in

DEVOTION

Sweetest the strain — when in the Song
the singer has been lost

We humbly submit this FRAGRANCE
for the delight and inspiration of the
Understanding in Heart.

SPARHAWK CO.

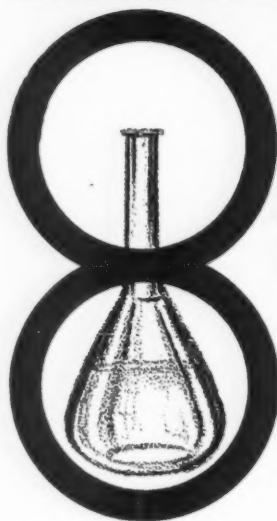
SPARKILL, N. Y.

Be not like the stream that brawls
Loud with shallow waterfalls,
But in quiet self control
Link together Soul with Soul

Longfellow

When from the censor clouds of
fragrance roll
And swelling organs lift the rising
soul
One thought of thee puts all the
pomp to flight
Priests, tapers, temples swim
before my sight.

Alexander Pope



Reasons Why **PLYMOUTH** **ZINC STEARATE U. S. P.** IS BEST FOR DRUGS AND COSMETICS

1 Backed by the longest commercial Stearate manufacturing experience in America . . . M. W. Parsons offer you this new product as the finest Zinc Stearate that can be made.

2 Years of research have made possible a particularly white product

3. Special production methods . . . developed over more than a quarter of a century . . . have made it ODORLESS

4 It will not develop offensive odors even if kept for a long period

5. It enables your face powder to retain the same odor that you give it.

6. A smooth, light, fluffy texture has been finally and definitely achieved.

7 Tested independently it shows the following results: ARSENIC (Gutzeit and Spectrographic Test) . . . Not Found. LEAD (Spectrographic Determination) . . . 1.7 parts per million.

8. The reputation and record of M. W. Parsons assure you of Uniformity in all shipments.

We also manufacture a superlative grade of **PLYMOUTH MAGNESIUM STEARATE**

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A complete line of Cosmetic Raw Materials

THE ROUND TABLE —

Selective Service Medal to Sheffield

L. Tracy Sheffield received recently a certificate of merit from the Congress of the United States and a selective service medal in recognition of his services during the war as a member of the selective service appeal board covering his congressional district.

Mr. Sheffield is president of the New England Collapsible Tube Co., whose home office is in New London, Conn., and which has branches in New York, Chicago and Los Angeles.



L. Tracy Sheffield

Cosmetic Chemists to Meet Next Month

The next meeting of the Society of Cosmetic Chemists will take place May 13, at the Biltmore Hotel, New York, N. Y., according to Dr. E. G. Klarmann, president of the Society.

Dr. Klarmann has announced that a larger group of scientific papers is to be presented at this meeting than at any previous one, and that the timing has been so arranged for those attending as not to conflict with other meetings.

Elizabeth Arden Case Goes to Supreme Court

Elizabeth Arden, New York, N. Y., has petitioned the Supreme Court to reverse the ruling of the U. S. Circuit Court of Appeals in New York City, upholding the Federal Trade Commission cease and desist order regarding demonstrators.

The Federal Trade Commission has set the date of May 5 when

Elizabeth Arden was required to file a report of compliance with the order.

Naugatuck Aromatics Adds to Sales Staff

Appointment of Willis F. Giddings and Edward J. Moran to the sales department, Naugatuck Aromatics Division, U. S. Rubber Co., has been announced by M. G. Couderchet, manager of the division.

Mr. Giddings has been in the company's synthetic rubber division for five years. Before that, he was for five years plant production superintendent on U. S. Rubber plantations in Sumatra. He is a graduate of Wesleyan University.



Willis F. Giddings



Edward J. Moran

Mr. Moran joined the company after three years in the Army. Before the war he was employed in personnel work in Antigua, B.W.I., and in Cuba. He was graduated from the University of Connecticut.

TGA to Hold Annual Convention May 14-16

The Toilet Goods Association has announced its annual convention for May 14, 15 and 16, at the Waldorf-Astoria Hotel, New York, N. Y.

L. R. Root is chairman of the Convention Committee. The Committee will operate from Room 630, Chrysler Bldg., New York, N. Y. Details of the program will be announced at a later date.

Charles B. Chrystal Honored for 50 Years Service to Industry

Weathering all of the wars, depressions and other vicissitudes that have plagued business in the last



Charles B. Chrystal

half century, the Charles B. Chrystal Co., Inc., New York, importers and grinders of minerals, clays and colors, celebrated its golden anniversary with a banquet at the Barbizon-Plaza hotel, New York City, on the evening of March 1.

The banquet, which was attended by the employees and their families and all members of the immediate family of the founder, was a tribute to the leadership of Charles B. Chrystal, who, in 1897, established the concern as an individual enterprise at 61 Beekman St. Under his direction the company grew and in 1921 it was incorporated. Four years later the warehouse and mills located in Jersey City were purchased. Prior to that they were located in many spots in Jersey City and Brooklyn. In commemoration of Mr. Chrystal's fifty years in business, a bronze plaque was given him by the employees and he also received an original etching from his family. Appropriate speeches were made by officers and employees of the company at the banquet.

Mr. Chrystal is still president and active head of the business whose destinies he has guided for so many years. In the management of the company which now does a nationwide business he is assisted by Thomas F. Cookson, vice-president; Harry Gottschalk, secretary; and Charles A. Chrystal, treasurer, all of whom have been associated with the company for years.

Selected Book List

DDT AND THE INSECT PROBLEM. By James C. Leary, William I. Fishbein & Lawrence C. Salter. Complete facts about the development, application and effectiveness of today's No. 1 insect killer—DDT. Cover both large-scale uses (such as crop protection, animal husbandry, etc.) and small-scale uses (such as elimination of household pests, destruction of garden pests, etc.). 154 pages, illustrated . . . \$2.50 postpaid.

SKIN DISEASES, NUTRITION & METABOLISM. By Erich Urbach, with the collaboration of Edward B. LeWinn. First and only book on the subject. Indispensable in the practice of dermatology, internal medicine and allergy. An immense amount of information needed every day by pediatricians, clinical pathologists and workers in the fields of metabolism, nutrition, biochemistry and dietetics. Well documented with photographs and tables. 634 pages . . . \$10.00 postpaid.

EMULSION TECHNOLOGY, THEORETICAL & APPLIED. A symposium. Revised 2nd edition. New section on the theory of emulsion compares and discusses all current conceptions in detail; gives clear picture of the viscosity, surface-film, surface-tension, solid particles, adsorption, hydration, oriented-adsorption, oriented-wedge and electro-kinetic theories and of their contribution to the explanation of various phenomena of emulsification. Special feature is list of emulsifying agents divided as follows: Anion Active Agents, Cation Active Agents, Non-Ionic Agents, and Miscellaneous Emulsifiers. This list includes trade names, chemical composition, emulsion type, references, manufacturer and recommended uses. Also contains data on methods of formation of many practical emulsions in the fields of drugs, cosmetics, beverages, foods, polishes, coatings, paints, etc. 360 pages . . . \$6.50 postpaid.

HACKH'S CHEMICAL DICTIONARY. 3rd edition, revised and edited by Julius Grant, M. Sc., Ph. D. Standard one-volume reference book on modern chemistry, including the collateral vocabularies of physics, astrophysics, geology, mineralogy, botany, zoology, medicine, pharmacy and the pertinent jargon of industry, mining and commerce. Over 57,000 entries, mostly encyclopedia in character, giving lucid definitions of each subject in light of new research

findings, and current acceptations. Numerous original tables of important data, diagrams, portraits, illustrations. Includes latest data on Atomic Disintegration. 925 pages . . . \$8.50 postpaid.

DEVELOPING MARKETABLE PRODUCTS AND THEIR PACKAGINGS. By Ben Nash. This book brings you the first organized treatment of the new essential business function which takes the guesswork out of measuring public reception—and assures your product the sales that are expected. It presents the author's well-known "pre-search" technique, and considers every aspect of marketing, performance, physical form and production in their relation to the sales appeal of the product. 404 pages . . . \$6.00 postpaid.

DRUG & SPECIALTY FORMULAS. By Emil J. Belanger. Tested, modern, practical formulas for human and veterinary remedies; cosmetics; food products; beverages; household, commercial & miscellaneous specialties. A digest of the new Federal Food, Drug & Cosmetic Act; suggestions for labeling drugs included. Little scientific knowledge or equipment needed for most formulas . . . \$6.00 postpaid.

PERFUMES, COSMETICS & SOAPS. By Wm. A. Poucher.

Vol. I (Dictionary of Raw Materials)	\$8.00	postpaid
Vol. II (Production of Perfumes)	8.00	"
Vol. III (Treatise on Cosmetics)	7.00	"

AMERICAN SOAP MAKER'S GUIDE. By P. B. Meerbott & I. V. Stanley Stanislaus. Treatise on art and science of manufacture of soap, candles and allied toilet preparations. Third, completely revised, edition of this exhaustive book—covers all new developments. 700 pages. 105 illustrations . . . \$7.50 postpaid.

COSMETICS AND HOW TO MAKE THEM. By Robert Bushby. This simply-written practical guide for beauty specialists, hairdressers and all others who are concerned with the preparation of face powders, vanishing creams, nail polishes, rouges, lipsticks and other cosmetics is a useful handbook for those who have had no previous knowledge of chemistry. The book contains easy to follow formulas and a great many recipes . . . \$3.00 postpaid.

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N. I. Malmstrom Returns From European Trip

N. I. Malmstrom, president of N. I. Malmstrom & Co., recently returned from an extensive business trip to the major capitals of Europe.

Commenting upon the status of general economic and business conditions he encountered on the continent, Mr. Malmstrom expressed the opinion that only small amounts of wool grease would be available for export to this country. He predicted that the shortage of wool grease would extend well into 1948.



N. I. Malmstrom

Negroes Found to Be Heavy Buyers of Cosmetics

The first Coast-to-Coast survey of the Negro market has been concluded by the Research Company of America, according to *Advertising Age*. The survey was sponsored by Interstate United Newspapers, Inc.

Of \$10 billion earned annually by this market, \$7 billion is "normally spendable," and \$350,000,000 of this goes into toiletries and personal care. According to the survey, the average Negro woman spends 150 per cent more of her income for toiletries and personal care than does the average white woman.

Cosmetology Advisory Committee for New York State

Secretary of State (N. Y.) Thomas J. Curran has named a five-member cosmetology advisory committee to carry out a law licensing and regulating hairdressers and cosmetologists, provisions of which become effective July 1.

Members are: Mrs. Anne M. Lewis, Mrs. Albert M. Kramer, Mrs. Magdaline McCoy, Mrs. Genevieve McGreal and Clarence B. MacNeil.

Trade Practice Conference for Cosmetic Industry Scheduled

The Federal Trade Commission has scheduled a trade practice conference for the cosmetic industry to be held in New York, N. Y., beginning May 12, and extending through May 13 if necessary.

CPSEA Elects S. M. Lind President

The Chicago Perfumery, Soap and Extract Assn. has elected Stanley M. Lind as president. Mr. Lind is a



S. M. Lind

graduate of Armour Institute of Technology and is secretary of Harry Holland & Son, Inc. Other officers elected are: Vice-President, George H. Stanton, U. S. Industrial Chemicals, Inc.; Secretary, James L.

Johnson, G. Barr & Co.; and Treasurer, William F. Kammerer, George Lueders & Co.

Joe Fein Returns From South-Eastern Trip

Joseph Fein, treasurer of Florasynth Laboratories, Inc., New York, N. Y., has returned from an extensive trip throughout the Southeastern states serviced by his organization. During most of his trip, Mr. Fein was accompanied by William Branch, Atlanta office manager.



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AROMATIC CHEMICALS
MUSK—CIVET—AMBERGRIS

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PAYAN & BERTRAND, S.A. • GRASSE, FRANCE

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"QUALITY MERCHANDISE GUARANTEED BY REPUTATION"

Standard

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remember in*

QUALITY TUBES



Standard

SPECIALTY & TUBE CO.

New Brighton, Pa.

ammonium thioglycolate by STANTON

The unsurpassed quality of STANTON'S Ammonium Thioglycolate is the result of years of specialization and jealously guarded purity of this important cosmetic base.

The last word in production and technical efficiency and careful laboratory controls assures absolute minimums of impurities such as di-thiodiglycollic acid, glycollic acid, iron and heavier metals.

When you buy STANTON Thioglycolate you buy insurance on stability, shelf-life, minimum irritation and the least amount of odor.

The results achieved are faster acting solutions and better permanent waves.



stanton laboratories, inc.

227 Krams Avenue

Philadelphia 27, Pa.

(factory and main office)

Patents Granted on Use of Polyethylene Glycols

Two patents relating to the use of polyethylene glycols in toilet preparations have just been issued, according to an announcement by Carbide and Carbon Chemicals Corp. U. S. patent 2,393,864 describes the use of the water-soluble, wax-like, solid polyethylene glycols in conjunction with solvents to improve creams for removing nail polish. The other, U. S. patent 2,309,722, reveals that similar polyethylene glycols can be used to improve hair pomades and to replace vegetable oil or lanolin in hand lotions for conditioning and softening the skin.

Mrs. Michael Stanton Wins Citation for Record Albacore Catch

Mrs. Michael Stanton, secretary-treasurer of Stanton Laboratories, Philadelphia, Pa., won a citation for a record catch of Albacore which weighed 16½ lbs., just one-half pound under the record, during her recent vacation in Florida. Michael Stanton, president, also enjoyed a well earned vacation in Miami, Florida, with Mrs. Stanton and while he won no citations for fishing he did

absorb a generous amount of sunshine and returned to his desk well browned.

John Powell's West Coast Plant Operating 24 Hours Per Day

The West Coast plant of John Powell & Co. of Calif., Inc., is now producing DDT concentrate, pyrethrum, rotenone and benzene hexachloride on a 24-hour-per-day basis, according to Esler Johnson, general manager. His office is at 503 Market St., San Francisco, Calif.



The main office of John Powell & Co., Inc. is located at 1 Park Ave., New York, N. Y.

Rene Forster Co. Moves to 66-68 Dey St., New York City

The Rene Forster Co. moved from its former location at 404 Fourth Ave. to new and more commodious quarters at 66-68 Dey St., New York 7, N. Y., April 1.

Chemical Market Research Association Meets in Wilmington

At the meeting of the Chemical Market Research Assn., held April 17 at the Hotel Du Pont, Wilmington, Del., Elwood F. Altmaire addressed the luncheon group on the subject "Market Research as a Basis for Long Range Planning." The afternoon was devoted to a symposium on the subject "Looking at Markets from the Inside—through Sales Analysis." Speakers were: Luther D. Reed, Harold O. Ladd and Frank Mansfield. The evening session was devoted to a discussion of "The Chemical Industry's Contribution to Industrial and Social Progress," by Albert E. Marshall.

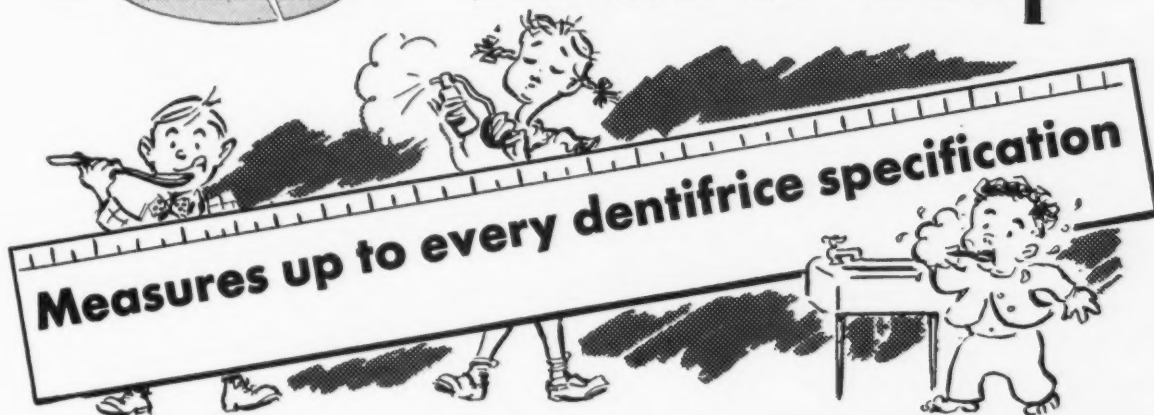
McLeod Wins Name Contest Sponsored by Pro-phy-lac-tic Brush

The Pro-phy-lac-tic Brush Co., Florence, Mass., has announced Edyth Thornton McLeod as the winner of the name contest for its new Jewelrite pattern. The winning name is "Swirltwist."

The contest was announced when the company exhibited its new line of brushes at a party in February at the Ritz Carlton, New York, N. Y.



Neutral Soap



NO TASTE

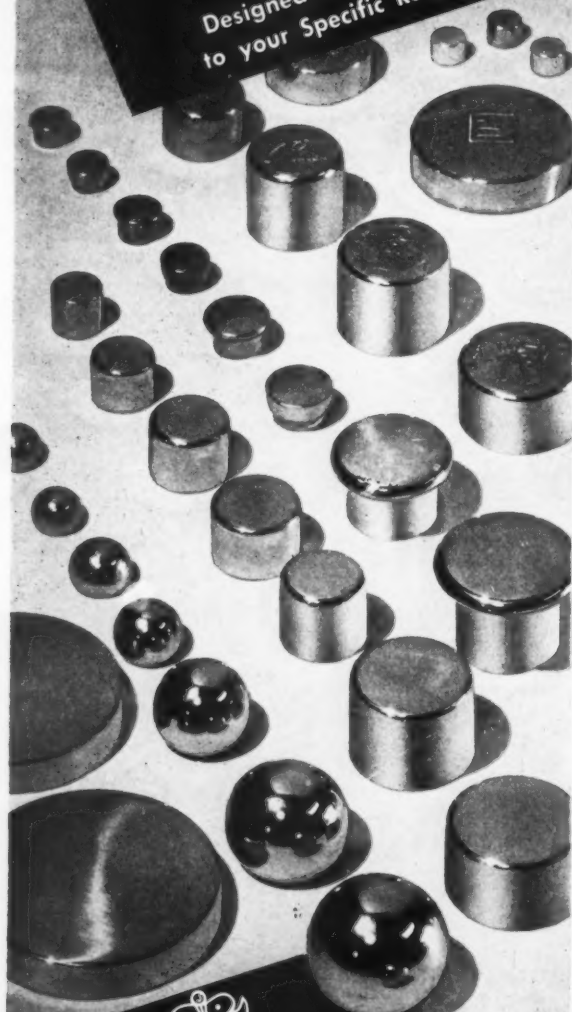
NO ODOR


PLENTY OF FOAM

Modern production methods and close selling margins make it possible for you to buy standardized, air-floated POWCO BRAND Pulverized Neutral Soap to suit your needs of better quality at a saving. Write today for your generous sample stating the use for which intended.

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Top off
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 Plain or Embossed
 or
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Benzyl Benzoate FFC

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Cinnamic Aldehyde N.F. VII

Heptylideneacetone

Methyl Benzoate

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Manufacturers of organic chemicals since 1915

F. E. M. A. Convention Plans

Plans are well under way to make the forthcoming convention of the Flavoring Extract Manufacturers Association at the Hotel Traymore in Atlantic City, May 26, 27 and 28, unusually interesting. George M. Chapman, chairman of the program committee, is securing a number of prominent speakers to discuss important developments in the industry and the various other committees are at work to insure entertainment. Dr. Clarke E. Davis is chairman of the convention committee, John H. Beach is chairman of the entertainment committee, Frank H. Green is chairman of the golf committee and William F. Fischer is chairman of the registration committee. Members who have not already done so are urged by L. P. Symmes, secretary, to make their hotel reservations now.

Andre Firmenich Returns to Geneva After Flying Visit to U. S.

Andre Firmenich, commercial director of Firmenich & Cie., Geneva, Switzerland, manufacturers of perfumers' materials, returned to Europe by airplane March 25 after a six



The first of a series of sales and manufacturing meetings was held recently at the New York headquarters of Innis, Speiden & Co., 117 Liberty St. Seated from left to right are: Donald S. Cushman, J. Bickerton, Conrad C. Johnson, Frank Grilli, Thomas G. Flavelle, P. L. Frost, director of the meeting, James E. Wickstead, Frank T. Shanahan, Herbert S. Cottrell and Edward E. Smith

weeks' business visit to the American company, Firmenich & Co., New York, N. Y., of which Rupert C. Watson is a partner and general manager. He flew to this country February 14. Robert E. Firmenich, son of Hugo Firmenich, accompanied by his wife, arrived March 12 by airplane by way of Amsterdam for a stay of several months in the United States to enable him to study American methods. This is the first visit of

Mr. and Mrs. Robert Firmenich to the United States.

Irving Biber Resigns from Darsyn Laboratories

Irving Biber, organizer of Darsyn Laboratories, Paterson, N. J., has resigned as president of the corporation and has severed his connections with that company.

TOP-QUALITY COCOANUT OIL
AND CASTILE

Shampoos

NOW AVAILABLE IN QUANTITY

- MADE WITHOUT CAUSTICS
- PERFECTLY NEUTRAL (pH 7)
- UNUSUALLY CLEAR AND THICK
- EXCEPTIONAL LATHER
- NO HAZING OR SEDIMENT

— AT COMPETITIVE PRICES —

If you are looking for a quality shampoo of exceptional merit, write for details and samples.

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Introducing

VEECOTE

A specially processed white powder with the following properties: a fine and uniform particle size, good coverage and hiding power, white color, excellent adherence, flat-white appearance.

Suggested Uses:

Face, body and medicated powders; cosmetic cakes and sticks; pigmented creams and lotions.

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PURE, WHITE
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Still using the same "old fashioned" methods proven successful for 95 years.

That's how long we've been bleaching beeswax since we first began operations in Holland in 1852.

Preference for high quality today is as strong as it was then.

That's why our customers would not think of letting us change production methods to gain "speed."

This same high quality extends through our entire line:

U.S.P. Pure Sunbleached Beeswax

U.S.P. Pure Yellow Refined Beeswax

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Micro Crystalline Petroleum Waxes

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ROSE ORIENTALE

• A regal and pulsating fragrance, deceptive in intensity yet luxurious and dramatic when used in Colognes, Bath Powder, or Talc. (Trial pound \$8.00.)



Three other exquisite Compounds include:

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EUGENOL . . . To the Compounder of Perfume Oils we offer a superior base for Carnation and Orientale Bouquets.



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The American Perfumer

BIMS 1947 Golf Dates and Annual Dinner Announced

Three golf matches have been scheduled by the BIMS of New York for this summer; and the date of the annual dinner has been fixed. The dates of the golf matches are: May 27, Wykagyl Country Club, New Rochelle, N. Y.; June 26, Knoll Country Club, Boonton, N. J.; and September 9, Plandome Golf Club, Plandome, N. Y. The annual dinner will be held January 22, 1948.

New Officers Elected by ADACIOM

At the annual meeting of the Associated Drug and Chemical Industries of Missouri, Inc., held March 12 at the Coronado Hotel, St. Louis, Mo., the following officers were elected: President, Glenn O'Neal, The Dow Chemical Co.; First Vice-President, William Van Alstyne, Jr., Merck & Co.; Second Vice-President, Jack C. Varley, Baird & McGuire Co.; Third Vice-President, John Varley, Od-Peacock-Sultan Co.; Secretary, John A. Mueller, S. Pfeiffer Manufacturing Co.; and Treasurer, J. Louis Lanz, Albert Albek, Inc.

Members of the executive commit-

tee are: Franc A. Barada, Dr. Justin S. Brewer, Charles E. Caspari, Paul A. Hein, George C. Irwin, Morton S. Johnson, Morton Meyer, James E. Montgomery and Marvin P. Yates.

Charles C. Bryan Joins Firmenich & Co. in Flavor Materials Dept.

Charles C. Bryan has joined Firmenich & Co., New York, N. Y., in charge of its newly established flavor materials department. He has been connected with the industry since 1937. During the war he served for three years in the Air Combat Intelligence branch of the U.S.A.A.F. of the China theater. Following his return he resumed his work in the essential oil business until January of this year when he joined Firmenich & Co.

Daggett & Ramsdell Introduces "Debutante"

The "Debutante" line, introduced by Daggett & Ramsdell, New York, N. Y., at a luncheon at the Hotel Pierre, March 25, is being merchandised through fashion tie-ups. This fashion news started with evening dresses by Ceil Chapman. It will be followed by news on hats, play suits,



Prince Matchabelli, New York, N. Y., introduced a new Spring lipstick color, "Paris Original," at a fashion show in the Crown Room March 12. The clothes, including the coat shown above, were designed around this new color, and they were created in Paris by Hermes

etc. All actual creations, designed for the debutante age, will be available on an exclusive basis to stores featuring the line.

New! Outstanding! AMERCHOL L-101

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AMERCHOL L-101 is one of many new Amerchols manufactured from specially processed Cholesterol and other sterols and will help you improve your products.


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gunning and gunning inc.

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KOMMON/ SCENTS!

Most interesting legislation these days has to do with literary censorship. The proposed bills aren't exactly narrow-minded. But under conservative interpretation, a physician's description of a hernia might get him an award from the Academy of Medicine and a five-year vacation in a penal institution.

Everybody's a critic. On a broad scale this is probably so, but we dread to think of what might happen to the Old Testament if Senator Bilbo wrote the critique for the Saturday Review of Literature.

In the arts and sciences, difference of opinion wins new horizons. In business, too, except when it loses old accounts.

Oh, well, back to the axe: The Republicans are using everything to curb Labor but medical science's Twilight Sleep.

The Elephant Boys must be using a poet for their slogans: For Russia, "Get Tough;" for us, "Had Enough?"

Brightest hope for the world is still in the United Nations Organization, where they've finally switched from cutting each other's throats to cutting each other's armaments.

Advocates of a Planned Economy should soon be screaming it was unfair to have two governors in Georgia while the United States lacks a single Vice-President.

The subject of Vice-President is intriguing. The Vice-Presidency is a stepping stone to oblivion, except where death overtakes the Chief Executive. (And there are times when it's true even without that reservation.)

Poor Tom Dewey. Thinks the teacher who took an apple from him when he was a kid should be satisfied with applesauce from him as Governor.

But, away with affairs of State and back to the Cosmetic Industry: Our product may not cure an unpleasant situation but it sure can cover it up. If she's under forty.

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Fritzsche Brothers Announces Changes in Management

Fritzsche Brothers, Inc., 76 Ninth Ave., New York, N. Y., has announced the retirement of Dr. A. Nicolaus as manager of the company's Clifton, N. J., factory after more than twenty-five years of service. He has been succeeded by Dr. Darrell Althausen.

To fill existing vacancies in its Board of Directors, the company has announced the election of the following new members: Dr. Ernest Guenther, chief chemist and third vice-president; B. F. Zimmer, Jr., and Fr  d H. Leonhardt. The latter has also been elected to fill the office of fifth vice-president.

United-Carr Fastener Enters Container Field

H. S. Beddoe, president of United-Carr Fastener Co., Hamilton, Ontario, announces the purchase of the Cosmetic Container Division of the Scovill Manufacturing Co., Waterbury, Conn. Herbert A. Roden will be general manager of the new division, and A. C. Morgan will be sales manager. A new plant has been purchased at Oakville, Ont., for the

manufacture of lipstick containers, compacts, rouge boxes, eye-shadow pencil parts, and other metal parts and products for the cosmetic industry.

Other United-Carr Fastener Co. appointments are: Robert M. Healy, as sales manager of the General Products Division, who is being transferred from the Toronto office, and J. R. Johnston as sales manager of the Slide Fastener Division, who is transferred to the Montreal office.

Florasynth Laboratories Appoints Martin and Robertson

Florasynth Laboratories (Canada) Ltd., 29 St. Paul St., Montreal, has announced the appointment of Martin and Robertson, Ltd., 329 Railway St., Vancouver, as the sole agent in the British Columbia territory. The Arthur Irish Co. had been the former representative.

Obituary

Max Isermann

Max Isermann, vice-president of Van Dyk & Co., Inc., Belleville, N. J., died at his home in Los Angeles, Calif., March 18, at the age of 60.

Until his retirement from active business several years ago because of poor health, he was actively associated with his brother, Samuel Isermann, in the management of Van Dyk & Co. He leaves a widow and two children.

Robert H. Cory

Robert H. Cory, president of Lamont, Corliss & Co., New York, N. Y., died in his home in Englewood, N. J., March 17, at the age of 65. He joined Lamont, Corliss & Co. as junior associate of Thomas W. Lamont. He subsequently became executive vice-president of the firm, which position he held until 1936, when he became president.

Robert Beucus

Robert Beucus, vice-president and advertising manager of the Andrew Jergens Co., Cincinnati, Ohio, died in Fort Lauderdale, Fla., March 12. He had gone to that city six weeks previously because of a heart ailment. Mr. Beucus joined the Jergens Co. in 1930 as advertising business manager. In this position he conducted the company's advertising in publications and on the radio. He was made a vice-president in 1935.

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MARKET REPORT

Tallow Rise Produces Higher Soap Prices

WHILE there has been a leveling off in the downward price trend in a number of essential oils, business generally has proved rather disappointing over the past month. Some trade factors attributed the quiet tone to the belief among buyers that many articles had not yet reached the bottom.

Considerable buyer resistance continued to prevail in the soap oils such as citronella, lavender, and geranium. For a time it appeared that citronella would go lower in price, but late advices from primary markets indicated considerable firmness in shipping prices. One major importer expressing his views on future developments stated here that it appears to be a question as to who will be able to hold out, buyers or sellers. Advices from India reported that only a very small amount of lemongrass remains unsold and that stocks will have to meet world requirements for another three months before new crop is available.

IMPROVED SUGAR OUTLOOK

The improved sugar outlook has tended to create a decidedly better feeling in the trade. Consumers continue to face other problems, however, such as containers, and shortages of other necessary materials. Beverage manufacturers are reported proceeding very slowly when making purchases.

Citrus oils were firm with the exception of lime. Demand for all varieties of orange was sufficient in volume to keep the market in a generally firm supply position. Lemon was moving directly into consuming channels leaving little material to be offered for sale in the open market. A slackening in the call for lime in the face of continued imports served to have a softening influence upon the general tone.

With the approach of the spring season, consumers were making inquiries as to prospects of price revisions in oil peppermint under the influence of an impending crop. Two producing regions in the country reported favorable weather and good crop prospects. On the other hand, some reports point out that representatives of the country's largest consumers were contracting for all of the crop that was possible at prevailing levels.

For a relatively brief period some houses moved their price of spearmint up to \$17 per pound. There appeared to be very little buying interest and since other suppliers had already regarded prices far beyond the reach of consumers, offerings of spot oil came from relatively few dealers here.

Arrival of approximately four cases of cinnamon bark oil from Ceylon aroused considerable attention in local trade circles. The supply position on spot has been exceed-

ingly difficult for a long while and there appears to be little hope for any immediate improvement in the spot position. Although there was an ample supply of both anise and cassia on spot, both articles have suffered a severe decline in price over the past six months.

The first change in synthetic camphor prices in a long while was announced by producers. Quotations were reduced 4¢ a pound as the result of the more favorable costs of raw material, turpentine.

Because of rising costs of molasses and sugar, citric acid prices were advanced 2¢ per pound. Rumors of the advance had been current in trade circles for several weeks. The change was the first in eight years.

SOAP PRICES INCREASE

An increase of 5 per cent in soap prices due to the steady rise in tallow, basic soap-making fat, served to strengthen prices for crude glycerin, by-product of the soap kettle. If tallow costs continue to increase, it is quite possible refiners will find it necessary to adjust their selling schedules on refined, or chemically pure glycerin. Based on sales of crude at 50¢ a pound, prices on refined glycerin should be around 70¢ a pound, tankcar basis, instead of 55¢, it was pointed out.

Menthol prices moved upward in keeping with the higher shipping prices from Brazil and China. Independent producers in Brazil advanced their prices from \$17 to \$17.40 per kilo while the syndicate was reported asking \$18 per kilo with intentions of later increasing the price to \$20. The latter figure would be equivalent to \$9.75 to \$10 per pound, duty paid.

Brazil, major source of our menthol supply during the war, will not be able to export more than 300 tons of menthol during 1947, whereas in 1946, 440 tons were exported, and in 1945, 570 tons.

Late shipping price of menthol from China was reported equivalent to \$8 a pound, duty paid. Goods in the hands of speculators, merchants, and banks are estimated at 350 cases, but there are only about 300 cases or 9 tons available for export.

Other major price developments in the markets over the past month included a series of advances in red oil and stearic acid, an advance of 1/2¢ a pound in formaldehyde, and a new high price of \$234 for copra, c.i.f., West Coast.

Production of stearic acid is well sold ahead and many orders are appearing in the spot market that cannot be filled. Although fairly large arrivals of crude coconut oil were noted from the Philippines, it is not yet clear whether this oil will find its way into goods for domestic consumption.



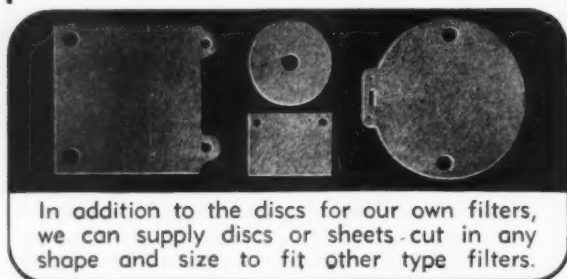
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PRICES IN THE NEW YORK MARKET

(Quotations on these pages are those made by local dealers, but are subject to revision without notice)

ESSENTIAL OILS					
Almond Bit, per lb.	3.50@	4.00	Citronella, Ceylon	2.35@	2.50
FFPA	4.50@	5.25	Java type	4.85@	5.50
Sweet True	.90@	1.10	Cloves, Zanzibar	1.55@	1.60
Apricot Kernel	.80@	.85	Coriander	19.50@	21.00
Amber, rectified	2.25	Nom'l	Imitation	12.00@	14.00
Angelica Root	120.00@	185.00	Croton	4.75@	5.00
Anise, U. S. P.	1.10@	1.25	Cumin	8.50@	9.25
Imitation	1.75@	2.10	Dillseed	7.00	Nom'l
Aspic (spike) Span.	2.00@	2.50	Erigeron	2.25@	5.00
Avocado	1.35@	1.40	Eucalyptus	1.20@	1.45
Bay	1.35@	1.60	Fennel, Sweet	3.75@	4.50
Bergamot	5.50@	5.85	Geranium, Rose, Algerian	15.75@	17.25
Artificial	3.35@	6.00	Bourbon	15.00@	20.00
Birch, sweet	2.50@	4.50	Turkish	9.00@	9.75
Birchtar, crude	5.50	Nom'l	Ginger	10.00@	12.00
Birchtar, rectified		Nominal	Guaiac (Wood)	2.80@	3.00
Bois de Rose	4.50@	5.10	Hemlock	2.65@	3.34
Cade, U. S. P.	.85@	1.00	Substitute	.55@	.60
Cajeput	2.70@	2.90	Juniper Berry	6.50@	9.50
Calamus	20.00@	22.00	Juniper Wood, imitation	.70@	.85
Camphor "white" dom.	.65@	.90	Laurel	5.00	Nom'l
Cananga, native	9.25@	10.00	Lavandin	4.50@	5.10
Rectified	11.00@	11.85	Lavender, French	10.25@	15.25
Caraway	5.65@	6.10	Lemon, Calif.	3.50@	
Cardamon	25.50@	26.00	Italian	3.85@	4.00
Cassia, rectified, U. S. P.	3.50@	3.75	Lemongrass	3.40@	3.90
Imitation	3.75@		Limes, distilled	5.75@	6.80
Cedar leaf	1.10@	1.25	Expressed	12.25@	13.10
U. S. P.	2.50@	2.85	Linaloe	5.50@	5.85
Cedar wood	1.00@	1.15	Lavage	95.00	Nom'l
Celery	17.50@	18.50	Marjoram	6.75@	7.50
Chamomile Roman	250.00@		Neroli, Bigarde P.	350.00@	390.00
Cinnamon bark oil	32.50@	41.00	Petale, extra	265.00@	300.00
			Olibanum	10.50@	12.00
			Opopanax	35.00@	38.00
			Orange, bitter	3.50@	3.95
			Brazilian	1.70@	2.00
			Calif., exp.	1.90@	2.00
			Orris Root, abs. (oz.)	135.00@	
			Artificial	36.00@	40.00
			Pennyroyal, Amer.	3.25@	3.75
			European	4.75@	5.15
			Peppermint, natural	8.00@	8.35
			Redistilled	8.60@	8.85
			Petitgrain	3.35@	3.90
			Pimento Berry	7.00@	7.60
			Pinus Sylvestris	4.25@	5.00
			Pumillonis	4.25@	4.75
			Rose, Bulgaria (oz.)	42.00@	46.00
			Synthetic, lb.	50.00@	55.00
			Rosemary, Spanish	1.35@	1.75
			Sage	3.00@	3.50
			Sage, Clary	19.00@	20.00
			Sandalwood, N. F.	18.00@	20.00
			Sassafras, artificial	.75@	.90
			Ocotea Cymbarum	.95@	1.00
			Snake root	22.00@	25.00
			Spearmint	15.00@	15.50
			Thyme, red	2.85@	3.25
			White	3.00@	3.25
			Valarian	70.00@	75.00
			Vetivert, Java	35.00@	37.50
			Bourbon	35.00@	40.00
			Wintergreen	3.65@	12.00
			Wormseed	5.35@	6.00
			Ylang Ylang, Manila	38.00	Nom'l
			Bourbon	15.00@	24.00

(Continued on page 431)



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MASCARA	CREAMS
SOAPS	Etc.

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B-W Lanolin the superior quality puts into your cream that which gives the skin that smooth soft velvety feeling.

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No other base used in your cream, equals the merits of B-W Lanolin.

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(Continued from page 429)

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Grapefruit	65.00	Nom'l
Lavender	26.00@	28.00
Lemon	40.00@	45.00
Lime, ex.	85.00@	100.00
Distilled	57.00@	60.00
Orange sweet	110.00@	135.00
Peppermint	14.00@	14.50
Petitgrain	7.25@	8.00
Spearmint	18.00@	20.00

DERIVATIVES AND CHEMICALS

Acetaldehyde 50%	1.90@	2.75
Acetophenone	1.65@	1.80
Alcohol C 8	4.25@	
C 9	14.00@	
C 10	4.25@	
C 11	11.50	Nom'l
C 12	4.25@	
Aldehyde C 8	11.00@	12.00
C 9	19.75@	22.00
C 10	7.50@	10.00
C 11	22.00	Nom'l
C 12	18.00@	22.00
C 14 (so called)	9.50@	9.75
C 16 (so called)	7.65@	8.25
Amyl Acetate	.55@	.75
Amyl Butyrate	1.00@	1.10
Amyl Cinnamate	4.50@	5.80
Amyl Cinnamate Aldehyde	2.35@	2.80
Amyl Formate	1.50	Nom'l
Amyl Phenyl Acetate	3.50@	3.75
Amyl Salicylate	.87@	.90
Amyl Valerinate	2.00@	2.25
Anethol	.80@	1.15
Anisic Aldehyde	2.60@	3.25
Benzoprenone	1.15@	1.30
Benzyl Acetate	.65@	.75

Benzyl Alcohol	.75@	1.00
Benzyl Benzoate	1.05@	1.20
Benzyl Butyrate	2.00@	2.25
Benzyl Cinnamate	4.25@	5.30
Benzyl Formate	2.80@	3.35
Benzyl-Iso-eugenol	9.50	Nom'l
Benzylidenacetone	1.75@	2.20
Borneol	1.80	Nom'l
Bornyl Acetate	2.25	Nom'l
Bromstyrol	6.00@	6.50
Butyl Acetate	.19 1/2@	.19 3/4
Cinnamic Alcohol	3.00@	3.60
Cinnamic Aldehyde	1.00@	1.10
Cinnamyl Acetate	7.30@	8.40
Cinnamyl Butyrate	12.00@	14.00
Cinnamyl Formate	10.00@	13.00
Citral, C. P.	7.25@	7.75
Citronellol	9.60@	10.00
Citronellyl Acetate	9.25@	12.00
Coumarin	3.00@	3.50
Cuminic Aldehyde	7.75@	10.00
Diethylphthalate	.38@	.40
Dimethyl Anthranilate	4.55@	5.00
Ethyl Acetate	.33@	.35
Ethyl Anthranilate	5.50@	7.00
Ethyl Benzoate	.75@	1.00
Ethyl Butyrate	.75@	.90
Ethyl Cinnamate	3.50@	3.80
Ethyl Formate	.70@	.80
Ethyl Propionate	.90@	1.00
Ethyl Salicylate	.90@	1.00
Ethyl Vanillin	6.75@	6.80
Eucalyptol	3.00@	3.50
Eugenol	2.85@	3.35
Geraniol, dom.	8.35@	9.00
Geranyl Acetate	7.85@	8.25
Geranyl Butyrate	10.25@	10.75
Geranyl Formate	12.50@	14.00
Heliotropin, dom.	3.10@	3.75
Hydrotropic Aldehyde	7.25@	7.75
Hydroxycitronellal	17.25@	17.65

Indol, C. P.	20.00@	23.00
Iso-borneol	1.30@	1.50
Iso-butyl Acetate	1.25@	2.00
Iso-butyl Benzoate	1.50@	2.60
Iso-butyl Salicylate	2.70@	3.00
Iso-eugenol	3.85@	4.00
Iso-safrol	1.50@	2.00
Linalool	6.75@	7.25
Linalyl Acetate 90%	7.50@	8.25
Linalyl Anthranilate	15.00@	
Linalyl Benzoate	10.50@	
Linalyl Formate	13.00@	15.00
Menthol	8.60@	9.00
Methyl Acetophenone	1.50@	1.80
Methyl Anthranilate	2.25@	2.40
Methyl Cellulose, f.o.b., ship-		
ping point	.60	Nom'l
Methyl Cinnamate	2.50@	3.50
Methyl Eugenol	4.00@	6.25
Methyl Heptenone	3.50	Nom'l
Methyl Heptene Carbonate	45.00@	60.00
Methyl Iso-eugenol	5.85@	10.00
Methyl Octine Carbonate	24.00@	30.00
Methyl Paracresol	2.50	Nom'l
Methyl Phenylacetate	3.00@	4.10
Methyl Salicylate	.42@	.45
Musk Ambrette	5.00	Nom'l
Ketone	4.15@	4.50
Xylene	1.75@	2.25
Neroline (ethyl ether)	2.00@	2.70
Paracresol Acetate	2.25@	2.80
Paracresol Methyl Ether	2.60@	2.85
Paracresol Phenyl-acetate	4.75@	5.25
Phenylacetaldehyde 50%	2.75@	
100%	4.15@	4.60
Phenylacetic Acid	2.00@	2.25
Phenylethyl Acetate	2.40@	3.10
Phenylethyl Alcohol	3.40@	3.60
Phenylethyl Anthranilate	16.00@	

(Continued on page 433)

CYCLONOL

CHARACTERISTIC ODOR and COOLING EFFECT OF MENTHOL

Cyclonol is chemically 1-methyl-3-dimethyl-cyclohexanol-(5). Graphically the structural formula is given in Fig. 1. It may be considered a lower homologue of symmetric or meta Menthol which has the structural formula shown in Fig. 2.

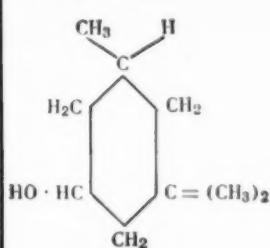


FIG. 1

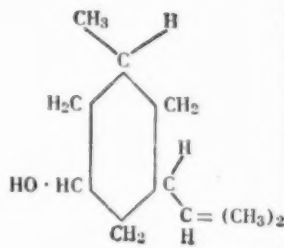


FIG. 2

Cyclonol replaces Menthol satisfactorily in shaving creams and lotions, liniments, analgesic balms, ointments and similar preparations. It has also been accepted by the U. S. Treasury Department as a Denaturant for alcohol in place of Menthol U.S.P.

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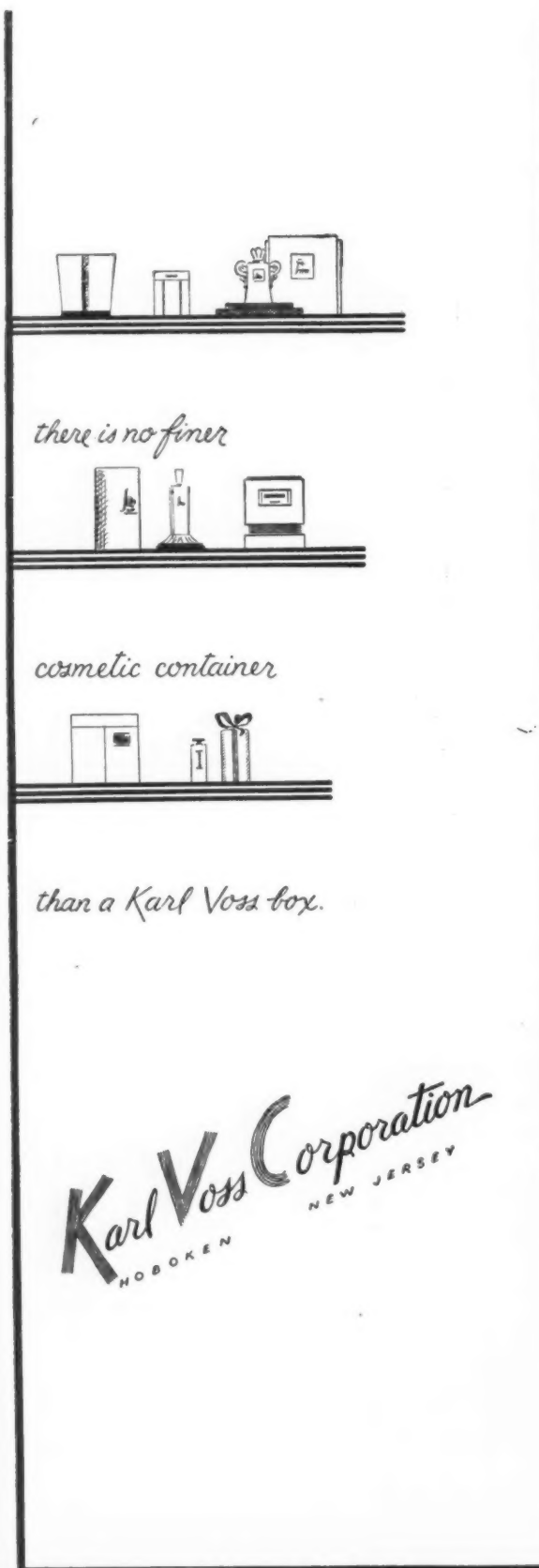
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THE ROMANCE OF

Incenses and Spices

HUGO ZAHND, Ph.D., ROSLYN SAPINKOPF*

THE term "incense" is derived from the Latin "incendere" (to burn) and connotes, in a general sense, a mixture of gums or spices used to produce a perfume when burned. The expression at the present time, however, is used almost exclusively to indicate frankincense (Francum Incensum).

ODORIFEROUS SUBSTANCES AND THE ANCIENTS

The burning of incense was practiced in connection with the religious ceremonies of numerous ancient nations. The peoples living in regions about the Red Sea and in Asia Minor developed processes for the extraction of odorous materials from certain species of shrubs, plants and trees growing mainly in these areas of our planet. The inhabitants, particularly of Arabia and Persia, enjoyed the reputation of being skilled in the art of the production of resins which played an important role in the religious and daily life of many ancient peoples. While the use of odoriferous substances was of prime importance in the religious rites of the Ancients, the Egyptians and Hebrews also attached aesthetic and medicinal importance to these products.

Priests burned incense during ceremonies, the perfume producing material consisting of spices or aromatic gum resins mixed with perfumed woods. The aroma of the odoriferous components was given off with the smoke during the process of combustion.¹ The Ancients used the incense as an offering which was pleasing to the Gods, the

gift being regarded as symbolical, not of prayer itself, but of that which makes prayer acceptable. Another possible use in religious ceremonies was the assumed power of the incense to drive away evil spirits and attract benevolent gods.

It appears that the Egyptians used at least fourteen different odoriferous substances for various purposes in addition to myrrh and frankincense.² Some of the odoriferous constituents (thyme, for example) were of domestic origin, others (myrrh and spikenard, for example) were most likely imported from Arabia.³ Thus we are told that Joseph was sold to merchants who were traveling from Gilead to Egypt in order to sell spices, balm and myrrh (Genesis 37:25).

According to Herodotus, the Egyptians used incense for embalming the dead. The procedure consisted in the removal of the brains by way of the nostrils and the intestines through an incision in the side of the body; the brains were then replaced by drugs and the intestines by powdered myrrh, cassia, and various other odoriferous substances, frankincense excepted.⁴ It was customary for the inhabitants of ancient Egypt to apply unguents and perfumed oils to the body after bathing. That the Egyptian regarded the possession of perfumes as signifying great wealth and numbered them amongst the most valuable commodities is shown by the fact that odoriferous substances were lavishly employed during religious processions and regal functions. At the fête of Isis, for instance, the Egyptians sacrificed an ox filled with frankincense, myrrh, and numer-

* Brooklyn College, Brooklyn, N. Y.

ous other aromatic substances.⁵ On another occasion, one hundred and twenty children carrying saffron, myrrh, and other perfume producing substances in golden basins were followed by a train of camels, each of the latter carrying three hundred pounds of frankincense, cassia, cinnamon, orris, and other valuable aromatics.⁶

In the days of the Bible, Babylon was the chief perfume market and was renowned for its choice scents which were kept in costly, exquisite bottles or flasks of alabaster or glass. The Babylonians and Syrians did not affix great value to their perfumes, and at times of festivals used scents most recklessly. During the reign of Antiochus, King of Syria, a series of games was held at Daphne: all who attended were liberally sprinkled with fifteen different kinds of perfumes (amaracus, cinnamon, lily, saffron, spikenard, and others) placed in golden watering pots, the latter being wielded by two hundred women who were chosen for their beauty.⁷

The Ancients recognized a close connection between the art of perfumery and astrology. The planets as well as the zodiacal signs were associated with specific odoriferous substances, thus placing the whole art of perfumery on an astrological basis. The planetary aromatics included: pepperwort, lignum aloes, saffron, cinnamon and myrtle: among the zodiacal substances used in perfumery were: galbanum, opopanax, lignum aloes, myrrh, pepperwort, mastic, benjamin, euphorbium, red storax, camphor, frankincense and sandal. These odoriferous products were assigned various occult properties. Mixtures composed of planetary or Zodiacal aromatics were used to bring success in games of chance, to overcome hazards and enemies, to be secure from malice, to develop a strong and magnetic personality, to improve one's financial condition, and to win the favor of those in power.⁸ The Egyptians were of the belief that the soul of the dead ascended to heaven with the smoke of the incense which was burned in his behalf.

The civilization of the Mediterranean was in close touch with Asia Minor and Egypt, and, therefore, the Greeks became acquainted with the use of odoriferous substances. It appears that gum resins were not put to use until post-Homeric times (about 850 B.C.), and it is thought by some that the introduction of incense was practiced by the cult of Aphrodite. Gum resins, such as frankincense, were brought to Greece by the Phoenicians.⁹ The Greeks imported saffron from Sicily, nard from Tarsus and chypre from Egypt and Phoenicia.¹⁰ While the use of incense and perfume was at first restricted to religious ceremonies, the employment of these substances among the Greeks became widely accepted for their aesthetic value.

On the other hand, the early Romans showed but little interest in the use of perfumes. However, by the time Nero became emperor, perfumes and cosmetics were in general use by the courtiers; during the funeral services for his wife Poppea, more incense was used than Arabia could produce in ten years. In later periods the offering of incense had become so important to the Romans that no religious rite was considered complete without it. The use of odoriferous woods and herbs was followed by the introduction of frankincense, myrrh, and crocus. Since the burning of incense was considered a pagan ceremonial by the Christians, the latter were forced by the Romans to adhere to this custom, and thus renounce their religion.¹¹ The Romans found that some unguents which contained

odoriferous substances improved with age and, therefore, stored them in lead containers.

The use of scents in Europe followed the end of the crusades. The knights upon returning to their homelands brought with them the exotic and romantic perfumes of the Orient. Since the use of odoriferous substances became very popular on the continent, ships were sent from Italy to the Near East in order to import the spices and aromatic resins which were native to these regions. By the time of Queen Elizabeth the popularity of perfumes and cosmetics increased to such an extent that they were used promiscuously by both sexes at the court. Cromwell and his puritan government forbade the use of these luxuries. The employment of perfumes was resumed during the reign of Charles II, and by the seventeenth century was so widespread among all classes that the parliament passed a law making it illegal for women to entice men into marriage through the use of scents, cosmetics, and other artificial agents.¹²

INCENSE AND THE BIBLE

"The custom of using incense for worship is very old. God, Himself, ordered Moses to construct and set up an altar overlaid with gold in the sanctuary of the tabernacle. Every morning and evening incense was burned on the altar as a sacrifice to the Most High. We learn from Holy Scriptures that Three Wise Men who came to worship the Infant Jesus brought incense as one of their gifts."¹³

The early Hebrews knew very little of the uses of odoriferous substances; they were a pastoral people, who, while aware of the commercial value of these products, did not employ them until a later date. Jacob, realizing the great commercial value which was assigned to these aroma producing substances by the Egyptians, suggested the carrying of myrrh to Egypt. It was during the captivity of the Hebrews in the latter country that they became acquainted with numerous uses of aromatic substances. Upon their release from bondage, the Hebrews introduced the use of incense in connection with religious ceremonials. During the exodus, Moses was given instructions dealing with the preparation of the holy anointing oil and the holy incense. The former consisted of myrrh, cinnamon, calamus, and olive oil, compounded after the art of the apothecary (*Exodus* 30:23-5); the latter was composed of stacte, onycha, galbanum, and frankincense (*Exodus* 30:34-5).¹⁴ Additional ingredients used for the compounding of incense to be used for religious worship (particularly in the Herodian temple) were myrrh, cassia, nard, saffron, costus, cinnamon, and cinnamon bark.

A great deal of confusion exists as to the true identity and date of first use of odoriferous substances by the Israelites. This condition is due, in part at least, to inconsistencies in the many translations of the Old Testament.¹⁵ The lack of consistency, with respect to the identity of the gum resins, was due also to the very meager knowledge of plant life possessed by the Hebrews. More recent studies of the chemical nature of some of the aromatic resins disclose similarities in chemical and physical properties in a number of cases, and, therefore, it becomes understandable why the Hebrews, in some instances at any rate, used the same term for the excretions of more than one kind of plant, provided that the growths and their exudations were similar in appearance.

While Ezekiel does not refer to the use of incense in his

account of the reformed ritual,¹⁶ the numerous references to the use of incense found in the Old Testament attest to the fact that the first and most important application to which scents were put by the Hebrews was in connection with religious rites (*Leviticus* 10:1; 16:13). As mentioned previously, the holy incense was compounded in accordance with specific instructions from the Lord (*Exodus* 30:34-5). Incense was burned at a specific hour in the morning and evening (*Exodus* 30:7-8), a special altar fashioned of shittim-wood being used for this purpose (*Exodus* 30:1-5). The offering of food during religious ceremonials was also associated with the burning of frankincense (*Leviticus* 2:1, 15). With the passage of time, odoriferous substances were used for secular purposes. Myrrh and frankincense were numbered among the most valuable treasures and were looked upon as adequate gifts to important personages. The queen of Sheba included spices amongst her presents to King Solomon (*II Chronicles* 9:1). Quotations, such as "Ointment and perfume rejoice the heart" (*Proverbs* 27:9), "All the garments smell of myrrh, and aloes, and cassia" (*Psalms* 45:8), and "I have perfumed my bed with myrrh, aloes, and cinnamon" (*Proverbs* 7:17) indicate the aesthetic value which was attached to the scents. The Hebrews, at a rather early date, used aromatics for medicinal purposes. Aaron, in order to make atonement for his people and check the plague, passed through his congregation with a censor containing burning incense (*Numbers* 16:46-8); the perfume thus produced, aside from its religious symbolism, was supposed to possess the properties of a fumigant. That the Israelites assigned astringent properties to myrrh and certain "sweet odours" is clearly indicated by the following passage: "Now when every maid's turn was come to go in to King Ahasuerus, after that she had been twelve month, according to the manner of the women, (for so were the days of their purifications accomplished, to wit, six months with oil of myrrh, and six months with sweet odours, and with other things for the purifying of women:)" (*Ester* 2:12).

Since the use of incense was regarded as a pagan custom by the early Christians, the latter refrained from the employment of odoriferous substances for their religious rites.¹⁷ It appears that the use of incense was initiated primarily in order to purify the unwholesome atmosphere prevalent in the caverns in which they were forced to hold their secret services.¹⁸ The priceless frankincense, which for nearly two thousand years was the offerings of kings to their Gods, was included among the gifts of the Magi to the infant Jesus (*Matthews* 2:11). That the custom of the Egyptians with respect to the manner of interring the departed had survived the ages is clearly implied by St. John: "And there came also Nicodemus, which at the first came to Jesus by night, and brought a mixture of myrrh and aloes, about an hundred pound weight. Then took they the body of Jesus, and wound it in linen clothes with the spices, as the manner of the Jews is to bury." (*St. John* 19:30-40). It was while burning incense in the temple that Zacharius received word from the angel Gabriel that he was to become the father of John the Baptist (*Luke* 1:9-13).^{*}

The use of incense at the ceremonials associated with communion appears during the latter part of the sixth cen-

tury. At the present time incense is employed by the Roman Catholic Church for such rites as the Solemn Mass, offertory, blessings, processions, and burial ceremonies. The incensing of persons of high office and of priests is also customary. The followers of the Roman Catholic faith hold that since the priest is the representative of Christ, rendering homage to him is a way of honoring Christ.¹⁹ According to the Catholic creed the symbolic meaning of the burning of incense varies. The fragrant smoke rising towards heaven is a symbol of prayer; the consumption of incense by fire signifies man's submission to the will of God; and the burning of incense which accompanies the blessing of articles symbolizes God's safe-guard. From a more practical point of view, the use of incense enhances the beauty and solemnity of the sermon.²⁰

Immediately following the period of the reformation, the English Church abstained from the use of incense for ritual purposes; its appliance by the Church was limited to fumigation and to the production of an agreeably scented atmosphere. The ritualistic employment of incense was resumed in the middle of the nineteenth century, and at present is used in many churches of the Anglican Communion as a pleasant adjunct to prayer.²¹

Declaring the usage of incense as pagan and idolatrous, the Protestant sects abstain from the employment of odoriferous products for ecclesiastical purposes.

While lack of space does not permit an account of the history and modern chemical knowledge of every incense which has been used by man, the following sections will deal with brief accounts of the "romance" and chemical nature of a few of the more interesting incenses and spices.

FRANKINCENSE

Frankincense,^{*} or olibanum as it is commonly called today, has been known and used by man for many centuries. It has been held in high esteem since ancient times for its pleasant odor, the latter becoming especially noticeable on burning of this resinous substance.

Evidence pointing to the use of frankincense by civilizations of the ancient world is not lacking. Thus paintings, depicting the olibanum trade between Arabia and Egypt, have been found at a temple in upper Egypt; these portraits, which were produced during the seventeenth century B.C., picture not only bags of olibanum but also the trees from which this product was derived.²² Records indicate that frankincense was imported from Punt (Somaliland) by the Egyptians during the eighteenth and twentieth dynasties.²³ The precious gifts sent to King Amon by King Usermase-Meriamon included over two thousand jars of white incense, probably frankincense.²⁴ Frankincense, in conjunction with myrrh, was used to counteract the obnoxious smell of burning flesh produced during the ceremonial sacrifices of oxen at the temple of Isis. The Egyptians used incense often for religious rites, a fact which is mentioned in the Book of the Dead.²⁵ According to the Papyrus Salt of the Saite Period, incense (perhaps frankincense) was considered as tears or other excretions of the Gods.²⁶ The commonest figure found in Egyptian temples is that of some Pharaoh worshipping a deity with anointing oil and incense; one of the most famous of these por-

^{*} Figurative references to incense are also found in the New Testament (*Revelation* 5:8; 8:3-4).

^{*} *Francum Incensum* is the name given to various oleo-resinous substances. The frankincense frequently employed in religious ceremonies is a gum resin obtained from the tree *Boswellia thurifera*, found particularly in some mountain ranges located in India (*Encyclopedia Americana*, Americana Corporation, New York, N. Y., 1911, (Vol. 12, p. 7).

trays is that found on a carved tablet placed on the breast of the Sphinx at Gizeh; it represents Tethmosis before his guardian deity pouring a libation of wine and offering incense.²⁷ Frankincense was also used for the staining of the eyelids and the drawing of black circles around the eyes. This custom was passed on to the Hebrews and later to the Romans, a practice which has been preserved in the East until quite recently. The belief existed that frankincense was beneficial to eyesight, and we find in this application the basis for the later employment of this incense in the field of medicine. The Egyptians apparently used frankincense as a preservative. As mentioned earlier in this paper, this gum resin was numbered amongst the zodiacal substances, and evidence for its use as one of the components of a mixture having the mystic property of bringing success in games of chance is also available.

The incense most frequently used by the Hebrews for religious purposes was frankincense.²⁸ What more perfect gift could the Magi have brought to the infant Jesus than the priceless frankincense.²⁹ In the days of Moses, God told man to include frankincense among the sacrificial offerings (*Exodus* 30:34). Frankincense, one of the components of the Holy Incense* (*Exodus* 30:37; *Leviticus* 24:7-9), in addition to its use as an incense in the worship of Jehovah, was employed by the Israelites in conjunction with meat and cereal offerings (*Leviticus* 2:1; 6:15).³⁰ Its use, however, was forbidden for sin and jealousy offerings (*Leviticus* 5:11; *Numbers* 5:15). Frankincense and shewbread were presented as the most holy of gifts to the Lord (*Leviticus* 24:7-9). On the day of Atonement, perhaps the most important of Jewish Holidays, frankincense was offered to Jehovah in the Holy of Holies and was burned before the Mercy seat (*Leviticus* 16:12-13). An early reference to frankincense designates this odoriferous substance as a variety of sacrificial material imported from Arabia (*Jeremiah* 6:20).

In addition to its religious uses, frankincense was utilized for various practical purposes by the Israelites. It was numbered amongst the luxuries of the wealthy, and it was most likely one of the ingredients used in the perfume burned in honor of deceased kings. This incense was included in mixtures intended to stupefy individuals who were about to undergo capital punishment. That preservative powers were assigned to this incense is indicated by the claim that it was employed for the tanning of skins. Another interesting use for frankincense was its application as a styptic on wounds. Frankincense, which may be found in the form of tear-like drops, was made into false beads for necklaces. As has been mentioned above, the use of this incense for the painting of the eyelids and the drawing of black circles around the eyes was a custom borrowed from the Egyptians. As in the case of the Egyptians, the burning of frankincense in the Hebrew temples, aside from its religious significance, was practiced in order to overcome the unpleasant odor produced during the sacrificial offering of animals. The vaporized incense, it was thought, brought about a sanitary effect by purifying the atmosphere and by penetrating the lungs and the blood stream of the devout.³¹

The Hebrews obtained most of this incense from Arabia (the southern district of Hydramaut) and from Punt

(Somaliland). During the days of Phoenician leadership, the inhabitants of Phoenicia acted as intermediaries between the producers and consumers of frankincense.³² The great popularity of this resin in the ancient world was in part due to the extensive trade carried on by the Phoenicians with the rest of the known world.

The Abyssinians used frankincense sometimes in place of gold for the purpose of trading.³³ The kings of Assyria offered this incense and libations of wine to the Tree of Life; according to Herodotus, frankincense was burned in large quantities at the annual feast of Bel.³⁴ Antiochus Epiphanes, King of Syria, while attending games at Daphne, instructed youths, arrayed in purple tunics, to anoint all guests with frankincense, myrrh and saffron.³⁵

Mohammedans in India used frankincense in rites such as circumcision, marriages, and funerals. It was commonly employed also in magical ceremonies.³⁶ The martyrdom of Ali is still commemorated by the Shea musselmans by marching with burning frankincense trees.

Frankincense has been sold in the bazaars of India since antiquity, and its medical properties are listed in the Hindu *Materia Medica*.³⁷ The burning of this incense during funeral services has been practiced by the Hindus since the very earliest times. The modern Hindu uses frankincense profusely and the burning of incense is regarded as one of the five sensuous offerings. Sticks of burning frankincense are offered to Jim by the Jains.

The Chinese have used frankincense for religious rituals for many centuries. This incense is frequently used in public and in private ceremonials. We find it offered in the temples as a part of daily worship, and it is burned habitually at festivals and processions. The gum resin is frequently burned before ancestral tablets or household deities; ceremonials associated with Chinese Buddhism are enriched by the burning of this incense. The employment of frankincense at funeral ceremonies plays a significant role; while one of its function is that of a fumigatory, another is its gratifying effect on the olfactory sense of the souls of the deceased. The Chinese name for frankincense, "ju-siang," connotes milk perfume, and, according to some, was assigned this name because of the milky white color of the pure product or by reason of the breast-shaped drops which it may assume. Evidence available indicates that this valuable resin was brought to China by the Arabs before the tenth century B.C. Because of its great popularity in China, Shanghai, until recently, was numbered amongst the largest importers of this luxury.

The Greeks, according to Theophrastus, received most of their frankincense from the country of the Sabaens. Perhaps the earliest description of the gathering of frankincense originates from the pen of this scholar: "The trees of frankincense and myrrh grow partly in the mountains . . . not tall, about five cubits high and it is much branched: it has a leaf like that of the pear, but much smaller and very grassy in color, like rue; the bark is altogether smooth like that of bay . . . incisions had been made both in the stems and in the branches, but that, while the stems looked as if they had been cut with an axe, in the branches the incisions were slighter; also that in some cases the gum was dropping but that in others it remained sticking to the tree; and that in some places mats woven of palm-leaves were put underneath, while in some the ground underneath was merely made level and clean; and that the frank-

*The Holy Incense was used to anoint the tabernacle, ark, furniture, vessels, and altar of the temples of the Hebrews Brim, C. J., "Medicine in the Bible," Froben Press, New York, N. Y., 1936 p. 12).

incense on the mats was clear and transparent, that collected on the ground less so; and that which remained sticking to the trees they scraped off with iron tools, wherefore sometimes pieces of bark remained in it. . . . The frankincense derived from young trees is whiter and less fragrant, while that derived from those which have passed their prime is yellower and more fragrant."³⁸ The trees were cut after budding, but not annually; the cutting, if carried out, usually took place after the rising of the Dog-star and during the hottest part of the year.³⁹ Frankincense was highly prized by the Greeks. Alexander the Great, after the capture of Gaza sent large quantities of frankincense and myrrh to Macedonia as a reward.⁴⁰ Alexander showed a great predilection for frankincense at an early age; thus, as a young man he was reprimanded by Aristotle for the too lavish use of this commodity.⁴¹ According to an inscription engraved on the ruins of the temple of Apollo at Miletus in Greece, Selencus II, king of Syria, and his brother Antiochus Hierax, king of Cilicia, offered gifts of gold, silver and frankincense as a token of homage.⁴²

According to Herodotus, the Scythians applied this odoriferous resin in the form of a paste to their bodies after bathing, this procedure giving the skin a most glossy appearance.⁴³

The Romans used frankincense for ecclesiastical as well as secular purposes.⁴⁴ The precious resin was used by the vestal virgins of Rome, and it was burned by the general populace in celebration of the victories of the Caesars.⁴⁵ Ovid states that frankincense, when mixed with nitre, fennel, rose-leaves and salammuniac gives rise to an excellent preparation for toilet purposes.⁴⁶ Plutarch notes that frankincense, when "fuming", produces benign physiological effects.⁴⁷ It is probable that Julius Caesar made use of the burning of frankincense for some of his public ceremonies; at any rate, it is certain that the Romans embellished many inaugural ceremonies by the employment of incense. Pliny, who wrote extensively on frankincense, bewails the military campaigns which were undertaken for the sole purpose of obtaining odoriferous substances. This author gives a detailed account of the physical properties of this incense and also recommends its use as an antidote for hemlock poisoning. According to Pliny, the Trojans refrained from the use of frankincense for religious worship.

The Catholic Church adopted the use of frankincense at a very early date. While according to Tertullian, this incense was used as early as 198 A. D., St. Augustine speaks of its employment in the year of 396 A. D.⁴⁸ Upon his conversion to Christianity, Emperor Constantine presented his newly adopted church with gifts of costly vessels and sundry aromatic substances, frankincense being included.

During the Middle Ages, the uses of frankincense were determined by the superstitions which were prevalent during this period. Its use was suggested for the treatment of such varied disorders as fevers, hemlock poisoning, boils, and leprosy; its employment as a tonic, a sedative, and a stimulant was also recommended.⁴⁹ The illustrious Arabian physicians Avicenna, Rhazes, and Mesue endorsed its utility for the treatment of various stomach disorders.⁵⁰ Its efficacy as a remedy for ulcers of the head and ears, vomiting, and dysentery was also emphasized. In the East it was used in external applications for carbuncles, blind boils, gangrenous sores and gonorrhea. Modern medical science

disclaims all the curative properties assigned to frankincense by the sages of past times.

With the coming of the eighteenth and nineteenth centuries and the development of science, sounder information concerning the nature of frankincense became available.

Frankincense (olibanum) is obtained from several trees of the genus *Boswellia*; the gum resin employed for religious purposes is obtained from *Boswellia thurifera*.⁵¹ Members belonging to this genus possess papyraceous barks, deciduous leaves, variously colored flowers (green, pinkish, white or yellow), triangular fruit and compressed seeds. Sir George Bidward distinguishes five species of *Boswellia*; of these, it is *B. Bhua-Dajiana*, *B. frereana*, and *B. carterii* which are particularly important sources of frankincense.⁵² Frankincense "may in general terms be described as a dry gum-resin, consisting of detached tears up to an inch in length of globular, pear-shaped clarate or stalactite form, mixed with more or less irregular lumps of the same size."⁵³ Members of the genus *Boswellia* grow in Arabia, Somaliland, and on some islands found situated in the Indian Ocean. It has been stated that the trees take root in marble rock,⁵⁴ being attached to the latter by a thick, oval mass of a material resembling a mixture of lime and mortar. While the young trees furnish the best grade of the odoriferous resin, the older specimen yields a clear fluid not unlike varnish in some of its properties. A choice grade of frankincense is obtained from trees growing in Somaliland, the Cape Elephant region, and the Southern Arabian Coast. India produces a pure product called white frankincense. American turpentine, from which Burgundy pitch is obtained, is frequently called frankincense.⁵⁵

The method of collection of frankincense (olibanum), as carried out in the Somaliland in the year of 1842, is described as follows: "During the hot season men and boys are daily employed in collecting gums, which process is carried on as follows: About the end of February or beginning of March, the Bedouins visit all the trees in succession and make a deep incision in each, peeling off a narrow strip of bark for about five inches below the wound. This is left for a month, when a fresh incision is made in the same place, but deeper. A third month elapses, and the operation is again repeated; after which the gum is supposed to have attained the proper degree of consistency. The mountain sides are immediately covered with parties of men and boys who scrape off the large clear globules into one basket, while the inferior quality that has run down the tree is packed separately. . . . Every fortnight the mountains are visited in this manner, the trees producing larger quantities as the season advances, until the middle of September when the first shower of rain puts a close to the gathering that year."⁵⁶

Frankincense, as found in commerce to-day, varies considerably in composition. Generally speaking, there are three grades of this incense: the white, more or less oval tears; the reddish colored garblings (still retaining some bark); and the dust or siftings.⁵⁷

Broadly speaking, frankincense may be described as a dry gum resin, consisting of detached globular or pear-shaped tears (up to an inch in length) mixed with irregular lumps (of similar size). While the better grade consists of small, nearly colorless or faintly green tears (very

* The common type of frankincense used today is obtained from the Norway Spruce and the pine tree.

small grains are transparent in nature), the less expensive variety is of yellowish or reddish-brown color. Examination with a polarizing microscope fails to reveal a crystalline structure. It possesses a slightly bitter taste, and the pleasant aromatic odor, which is associated with this product, becomes particularly pronounced during its combustion. Frankincense burns with a bright white flame, leaving an ash containing calcium carbonate, calcium phosphate, potassium sulphate, potassium chloride and potassium carbonate. This gum resin becomes opaque on immersion into alcohol and forms an emulsion with water; the resin fraction is soluble in alcohol. Upon steam distillation, frankincense yields a number of essential oils. The gum portion, to some extent at least, resembles gum arabic. According to chemical studies carried out in connection with the resin fraction, the presence of l-alpha pinene and dipentene, phelladrene, cadinene, d,l- and d-alpha pinene, camphene, verbenol, esters of d-borneol, and para cymene have been identified. The chemistry of oxygenated compounds has not been satisfactorily solved. The structure of the alcohol olibanol remains unknown.⁵⁸ "Gum Thus", sometimes mistakenly held identical with frankincense, in the drug trade refers to the oleo-resin scraped off the trunks of *Pinus palustris*, N. O. Coniferae, a tree grown in Central America.⁵⁹

The present uses of frankincense are not restricted to the employment for religious ceremonials linked with numerous faiths, but many of the applications of the ancients are retained to this day. As in ancient times, this gum resin is used in the East by the less informed as a medical agent. The inhabitants of the Red Sea region use the product as a masticatory. Frankincense is described as an ingredient of pitch plaster, the latter being recommended as a mild counter-irritant in cases of bronchitis and for the relief of pains due to rheumatism and lumbago.⁶⁰ Egyptian women, to this day, use frankincense for the darkening of eyelids, and as a chewing gum to perfume their breath.⁶¹ In the field of perfumery, this gum resin is used as a fixative for scents of the heavy oriental and fancy flower types of perfumes; in this case frankincense imparts strength and lasting velvety tonality, without masking the odor of the product to which it is added.⁶² While many of the incenses of the Ancients have passed into oblivion, frankincense still retains much of its popularity.

CINNAMON

"Robbed of your bark in masses large
It's sent abroad by ship and barge;
And India's fragrance you bestow
In summer climes and frigid snow."⁶³

Cinnamon (the inner bark of *Cinnamomum zeylanicum*) has been known to man for many centuries. It is probable that the earliest source was located in the Far East.⁶⁴ Although cinnamon is mentioned as an important article of trade of the apocalyptic Babylon (*Revelation* 18:13) and it is differentiated from cassia by the Ancients, a controversy has arisen as to the source of the Ancients' supply of the spice and whether true cinnamon (derived from *Cinnamomum zeylanicum*) was in use at that time. According to numerous authorities, the cinnamon of the Ancients was *Cassia lignea* and not true cinnamon. Galen asserts that cinnamon and cassia are so similar that the best grade of cassia can be readily substituted for the poorest cinnamon, provided a double weight of the cassia is used.^{65, 66} Two

Hebrew words have been translated as cassia. The first, "kedh" (*Exodus* 30:24), is supposed to represent *Cinnamomum cassia* of India, which was included amongst the merchandise of Tyre (*Ezekiel* 27:19); the second, "ket-ziah" (*Psalms* 45:8), refers to an aromatic spice derived from some unidentified tree. The Greeks, according to Herodotus, acquired the term Cinnamon from the Phoenicians.⁶⁷

Various opinions exist as to the country which served as the origin for this spice. Dioscorides, Ptolemy and others were of the opinion that cinnamon and cassia were imported by the Phoenicians who traded with the Arabians by way of Egypt and the Red Sea.⁶⁸ Solomon mentions the Indian perfumes, including cinnamon, which indicates that there was trading in the Far East.⁶⁹ The Arabian or Persian word for cinnamon is Chinese wood or bark and, therefore, points to an oriental origin;⁷⁰ this product, on the other hand, might be identical with *Cassia lignea* derived from *Cinnamomum cassia*, which was and still is obtained from Southern China.⁷¹ According to Partington, "what is called cinnamon" in the Holy Bible "is really the Chinese cassia and not true cinnamon."⁷² The ancient Egyptians, according to some authorities, procured their cinnamon from the mysterious land of Punt, which is identified with Rego Cinnamonifera at the promontory of Garadafiri in modern Somaliland. But neither true cinnamon nor cassia were or are produced in this region.⁷³ Pliny was of the opinion that the "most precious of spices" came from Ethiopia instead of from Arabia.⁷⁴ Strabo, the eminent geographer, states: "the parallel of the cinnamon countries on the one side passes a little south of Taprobane (Ceylon), or perhaps over its southern extremity, and, on the other side, over the most southern part of Libya."⁷⁵ It appears, however, that the earliest knowledge of cinnamon came from China by way of Persia to Judea and Phoenicia. Cinnamon is mentioned in the herbbook of the Chinese Emperor Shen-nong and was known in China as early as 2,700 B.C. under the name of "kwei" and according to Gibbs, was introduced into Egypt about 1600 or 1500 B.C.⁷⁶ It should be noted, however, that due to inconsistencies in translations, it remains an open question whether the cinnamon in Chinese literature refers to true cinnamon or cassia. In the Chinese "Materia Medica" cinnamon or cassia is designated by the name of "kwei." The tree perfume "Shoo-heang," mentioned in some treaties dealing with Ming history, cannot be identified with any degree of certainty with cinnamon oil.⁷⁷

The Arabian merchants, who controlled the spice trade, intentionally shrouded the source of their spices in mystery and encouraged fantastic tales with regard to the collection of these valuable commercial products. It was claimed, for instance, that the bark associated with cinnamon came from the land where Bacchus spent his youth. Herodotus tells how great birds utilized the sticks from spice trees to build their nests, the latter being pasted on the sheer faces of rocks located at great heights. The Arabians, according to this tale, would then place large pieces of meat on the neighboring plains and the hungry birds would deposit the meat in their nests; the added weight would cause the nests to fall and the spice containing branches became available for collection.⁷⁸ Theophrastus, who named Arabia as the country of origin for cinnamon, gives an accurate description of the tree, and

he seemed to be aware of the superiority of its bark as a source for the spice. He recounts but derides another popular legend about the gathering of cinnamon: "And there is also a tale told about it; they say that it grows in deep glens, and that in these there are numerous snakes which have a deadly bite; against these they protect their hands and feet before they go down into the glens, and then, when they have brought up the cinnamon, they divide it in three parts and draw lots for it with the sun; and whatever portion falls to the lot of the sun they leave behind; and they say that as soon as they leave the spot, they see this take fire. Now this is sheer fable."⁷⁹

The question as to the source of the Ancients' supply of the spice and whether true cinnamon or some closely related substance, such as cassia, was used cannot be answered with certainty; the evidence available points to the use of true cinnamon as well as various species of cassia.

"Cinnamon and cinnamon oils have been important ingredients of perfumes at a very early date. The priests of the earliest religions were skilled in the manufacture of perfumes; the latter skill was looked upon as an ecclesiastical mystery and its products were first used extensively in religious rites."⁸⁰ According to Theophrastus, cinnamon was one of the principal components used for the manufacture of perfumes.⁸¹ The Egyptian Papyrus Ebers, dating back to about 2000 B.C., names the fragrant spice as one of the aromatic substances used in embalming and in perfumery.⁸² Herodotus lists cassia and other perfumes (most likely including cinnamon containing perfumes) as the powdered aromatics inserted into the abdominal cavity in embalming.⁸³ According to Loret, the celebrated perfume "Kyphi" contained cinnamon in addition to other aromatics.⁸⁴ Various mixtures of aromatics containing cinnamon were used by the Egyptians as incense, as medical preparations and as offerings to the god Re. Another renowned perfume, applied to the hands and feet, was "Aegyptium"; this product also contained a large amount of cinnamon.⁸⁵ An Egyptian perfume, composed of myrrh and cinnamon, was said to retain its aroma for a longer period of time than any other perfume, excepting Iris.⁸⁶

The Hebrews (*Psalms* 45:8; *Proverbs* 7:17) as well as the Greeks and the inhabitants of numerous nations of the East scented their clothes, beds, and couches with the sweet odor of cinnamon.⁸⁷ The fragrant spice is mentioned as a precious odoriferous substance in the Biblical books of *Psalms*, *Proverbs*, *Ezekiel*, *Revelations*, *Canticles*, and the Mosaic writing.⁸⁸ The Old Testament (*Exodus* 30:23) as well as the Talmud give detailed instructions for the preparation of the Holy Incense and the amounts of cinnamon and other spices and aromatics are prescribed.⁸⁹ According to one authority, the stacte used for the Holy Oil is in reality a distillate composed of myrrh and cinnamon.⁹⁰ The list of favorite aromatics of the Jews contained in the *Canticles* (4:4), also known as the Song of Songs, includes cinnamon. "The Hebrews obtained the spice from the Midianites and the Nabathaeans who brought the product from the Arabian Gulf."⁹¹ The Arabians were the first navigators of the Indian ocean and no doubt must have had commercial intercourse with Ceylon and Continental India.⁹² It is possible that the spice could have come from India and China or from Africa and Arabia.⁹³

That the Greeks used fragrant substances, including cinnamon, for religious as well as secular purposes has been

emphasized previously. Cinnamon, it should be noted, was a constituent of the celebrated and costly Greek perfume known as "Megaleion."⁹⁴ A number of other Greek perfumes contained this famous spice.⁹⁵ The great value attached to cinnamon is stressed by the priests, who, in describing the Elysian fields, speak of a golden city with emerald ramparts, ivory pavements and cinnamon gates.⁹⁶

The Romans, no doubt, obtained their supply of cinnamon from the Arabs, who in turn acquired this important article of commerce from merchants of India.⁹⁷ The odor of the famous spice came thus to be linked with "Araby the Blest."⁹⁸ During the reign of Augustus, the Romans invested a large sum of money (£403,000) in the cinnamon trade; the imported product was subsequently sold at a 100 per cent profit.⁹⁹ As in the case of other ancient nations, the Romans employed the spice for ecclesiastical and secular purposes. Vespasian upon returning from Palestine dedicated garlands of cinnamon to the Goddess of Peace. The Empress Augusta, in honor of her husband, Augustus Caesar, planted a root of a cinnamon tree in a gold cup.¹⁰⁰ Large quantities of spice were consumed on Sylla's funeral pile, and Nero, as previously alluded to, burned a large supply of cinnamon and cassia at the obsequies for his wife Poppaea.¹⁰¹ Cinnamon was incorporated in the composition of various renowned unguents,¹⁰² and its use as an ingredient in perfumery was very popular with the Romans.

Perhaps the earliest allusion to the existence of cinnamon in northern Europe is that found in a document issued by the king of the Franks, Chilperic II, to the Norman monastery of Corbie in 716 A.D.; in this record mention is made of a supply of groceries and spices, the latter including five pounds of cinnamon.¹⁰³

Italian letters of the early Middle Ages mention gifts of cinnamon which were exchanged between famous rulers and also between high officials of the Christian Church. In the ninth century, cinnamon and other spices (pepper, cloves and costus) were used by the monks of the monastery of Saint Gall in Switzerland in order to season fish.¹⁰⁴ The pecuniary value of cinnamon was noted in England as early as 1264 A.D.¹⁰⁵ From the thirteenth century to the end of the sixteenth century evidence accumulated pointing to Ceylon as the source of the finest grade of cinnamon.¹⁰⁶

After the discovery of the passage around the Cape of Good Hope, the Portuguese replaced the Venetians as the merchants of Europe. Because of the rich treasure of cinnamon found in Ceylon, the latter country was taken over by the Portuguese in 1536 A.D. A treaty with the king of Kandy established Portuguese right to a large share of the cinnamon supply of Ceylon.¹⁰⁷ Accounts dealing with the cinnamon trade became now more trustworthy. The precious Oriental spice was offered as a New Year's gift to King Philip and to Queen Mary of England as well as to their successor, Queen Elizabeth.¹⁰⁸ By the year of 1571 A.D. cinnamon branches were seen in Bristol and in Holland.¹⁰⁹ The turbulent political and economical history of Ceylon, after its submission to the Portuguese, was closely associated with its great source of wealth, cinnamon. In the year of 1652 A.D. the Portuguese control of Ceylon was taken over by the Dutch, who, until 1769 A.D. used the wild jungle cinnamon as a precious commercial commodity.¹¹⁰ In 1770 A.D. De Koke initiated the cultivation of

cinnamon, the trees flourishing miraculously on the western coast of the island.¹¹¹ Numerous cinnamon gardens were soon established.¹¹² In order to preserve their monopoly, the Dutch ruled the removal of the seed as a crime punishable by death; the penalty for mutilating a tree was the loss of the right hand.¹¹³ In 1796 A.D. Ceylon was captured by the British who maintained the monopoly. The appearance of Southern China cassia and other varieties of less expansive cinnamon challenged the position of the expensive true cinnamon in world trade.¹¹⁴ The monopoly was finally abolished in 1933 A.D.¹¹⁵

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(This article will be continued in the subsequent issue.)

